Service Manual

# Service Manual
## GX500

Model : GX500

# Table Of Contents

# 1. INTRODUCTION

## 1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of the GX500.

## 1.2 Regulatory Information

### 1.2.1 Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges you're your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. LGE does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. LGE will not be responsible for any charges that result from such unauthorized use.

### 1.2.2 Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### 1.2.3 Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the GX500 or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### 1.2.4 Maintenance Limitations

Maintenance limitations on the GX500 must be performed only at the LGE or its authorized agents. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

### 1.2.5 Notice of Radiated Emissions

The GX500 complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

# 1. INTRODUCTION

### 1.2.6 Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

### 1.2.7 Interference and Attenuation

An GX500 may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

### 1.2.8 Electrostatic Sensitive Devices

**ATTENTION**
Boards, which contains Electrostatic Sensitive Device(ESD), are indicated by the sign. Following information is ESD handling: Service personnel should ground themselves by using a wrist strap when exchange system boards.
When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded. Use a suitable, grounded soldering iron. Keep sensitive parts in these protective packages until these are used. When returning system boards or parts such as EEPROM to the factory, use the protective package as described.

## 1.3 ABBREVIATION

For the purposes of this manual, following abbreviations apply:

◆ **APC** — Automatic Power Control
◆ **BB** — Baseband
◆ **BER** — Bit Error Ratio
◆ **CC-CV** — Constant Current – Constant Voltage
◆ **CLA** — Cigar Lighter Adapter
◆ **DAC** — Digital to Analog Converter
◆ **DCS** — Digital Communication System
◆ **dBm** — dB relative to 1 milli-watt
◆ **DSP** — Digital Signal Processing
◆ **EEPROM** — Electrical Erasable Programmable Read-Only Memory
◆ **EGPRS** — Enhanced General Packet Radio Service
◆ **EL** — Electroluminescence
◆ **ESD** — Electrostatic Discharge
◆ **FPCB** — Flexible Printed Circuit Board
◆ **GMSK** — Gaussian Minimum Shift Keying
◆ **GPIB** — General Purpose Interface Bus
◆ **GPRS** — General Packet Radio Service
◆ **GSM** — Global System for Mobile Communications
◆ **IPUI** — International Portable User Identity
◆ **IF** — Intermediate Frequency
◆ **LCD** — Liquid Crystal Display
◆ **LDO** — Low Drop Output
◆ **LED** — Light Emitting Diode
◆ **LGE** — LG Electronics
◆ **OPLL** — Offset Phase Locked Loop
◆ **PAM** — Power Amplifier Module
◆ **PCB** — Printed Circuit Board
◆ **PGA** — Programmable Gain Amplifier
◆ **PLL** — Phase Locked Loop
◆ **PSTN** — Public Switched Telephone Network
◆ **RF** — Radio Frequency
◆ **RLR** — Receiving Loudness Rating
◆ **RMS** — Root Mean Square
◆ **RTC** — Real Time Clock
◆ **SAW** — Surface Acoustic Wave
◆ **SIM** — Subscriber Identity Module
◆ **SLR** — Sending Loudness Rating
◆ **SRAM** — Static Random Access Memory
◆ **STMR** — Side Tone Masking Rating
◆ **TA** — Travel Adapter
◆ **TDD** — Time Division Duplex
◆ **TDMA** — Time Division Multiple Access
◆ **UART** — Universal Asynchronous Receiver/Transmitter

# 1. INTRODUCTION

◆ **VCO**             Voltage Controlled Oscillator
◆ **DCXO**          Digitally Controled Crystal Oscillator
◆ **WAP**            Wireless Application Protocol
◆ **8PSK**           8 Phase Shift Keying

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## 2.1 H/W Feature

| Item | Feature | Comment |
|------|---------|---------|
| Standard Battery | Lithium-Ion Polymer, 15000mAh | |
| AVG TCVR Current | 265mA typ | @PL5 |
| Standby Current | 3.7 mA typ | @PP5 |
| Talk time | 7 hours (GSM TX Level 7) | |
| Standby time | Over 390 hours (Paging Period:5, RSSI: -85dBm) | |
| Charging time | Under 3.5 hours | |
| RX Sensitivity | EGSM/GSM850:-105dBm↓ ,DCS/PCS:-105dBm↓ | |
| TX output power | EGSM/GSM850 : 33dBm (@PL 5)<br>DCS/PCS: 30dBm (@PL 0) | |
| GPRS compatibility | Class 12 | |
| SIM card type | 3V Small | |
| Display | Main 240 × 400 pixels, 3" WQVGA, 262K color | |
| Status Indicator | Send Key, Shortcut Key, Volume Up/Down Key, PWR Key, Camera Key, Lock Key | |
| ANT | Built in antenna | |
| EAR Phone Jack | 5pin Micro USB | |
| PC Synchronization | Yes | |
| Speech coding | HR/EFR/FR/AMR | |
| Data and Fax | Yes | |
| Vibrator | Yes | |
| Buzzer | No | |
| Voice Recoding | Yes | |
| C-Mic | Yes | |
| Receiver | Yes | |
| Travel Adapter | Yes | |
| Options | Bluetooth hands-free kit, Data Kit | |

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## 2.2 Technical specification

| Item | Description | Specification |
|------|-------------|---------------|
| 1 | Frequency Band | GSM850<br>    TX: 824 + 0.2 x n MHz<br>     RX: 869 + 0.2 x n MHz ( n = 128 ~ 251 )<br>EGSM<br>    TX: 890 + 0.2 x (n-1024) MHz<br>    RX: 935 + 0.2 x (n-1024) MHz ( n = 975 ~ 1023 /1 ~ 124)<br>DCS1800<br>    TX: 1710 + ( n-511 ) $\times$ 0.2 MHz      (n = 512 ~ 885)<br>     RX: TX + 95 MHz<br>PCS1900<br>    TX: 1850.2 + ( n-512 ) $\times$ 0.2 MHz    (n = 512 ~ 810)<br>    RX: TX + 80MHz |
| 2 | Phase Error | RMS < 5 degrees<br>Peak < 20 degrees |
| 3 | Frequency Error | < 0.1ppm |

### Power Level (Item 4)

**GSM850/EGSM**

| Level | Power | Toler. | Level | Power | Toler. |
|-------|-------|--------|-------|-------|--------|
| 5 | 33 dBm | ±2dB | 13 | 17 dBm | ±3dB |
| 6 | 31 dBm | ±3dB | 14 | 15 dBm | ±3dB |
| 7 | 29 dBm | ±3dB | 15 | 13 dBm | ±3dB |
| 8 | 27 dBm | ±3dB | 16 | 11 dBm | ±5dB |
| 9 | 25 dBm | ±3dB | 17 | 9 dBm | ±5dB |
| 10 | 23 dBm | ±3dB | 18 | 7 dBm | ±5dB |
| 11 | 21 dBm | ±3dB | 19 | 5 dBm | ±5dB |
| 12 | 19 dBm | ±3dB | | | |

**DCS1800/PCS1900**

| Level | Power | Toler. | Level | Power | Toler. |
|-------|-------|--------|-------|-------|--------|
| 0 | 30 dBm | ±2dB | 8 | 14 dBm | ±3dB |
| 1 | 28 dBm | ±3dB | 9 | 12 dBm | ±4dB |
| 2 | 26 dBm | ±3dB | 10 | 10 dBm | ±4dB |
| 3 | 24 dBm | ±3dB | 11 | 8 dBm | ±4dB |
| 4 | 22 dBm | ±3dB | 12 | 6 dBm | ±4dB |
| 5 | 20 dBm | ±3dB | 13 | 4 dBm | ±4dB |
| 6 | 18 dBm | ±3dB | 14 | 2 dBm | ±5dB |
| 7 | 16 dBm | ±3dB | 15 | 0 dBm | ±5dB |

| | | | | |
|---|---|---|---|---|
| 5 | Output RF Spectrum (due to modulation) | **GSM850/EGSM** | | |
| | | Offset from Carrier (kHz). | Max. dBc | |
| | | 100 | +0.5 | |
| | | 200 | -30 | |
| | | 250 | -33 | |
| | | 400 | -60 | |
| | | 600 ~ 1,200 | -60 | |
| | | 1,200 ~ 1,800 | -60 | |
| | | 1,800 ~ 3,000 | -63 | |
| | | 3,000 ~ 6,000 | -65 | |
| | | 6,000 | -71 | |
| | | **DCS1800/PCS1900** | | |
| | | Offset from Carrier (kHz). | Max. dBc | |
| | | 100 | +0.5 | |
| | | 200 | -30 | |
| | | 250 | -33 | |
| | | 400 | -60 | |
| | | 600 ~ 1,200 | -60 | |
| | | 1,200 ~ 1,800 | -60 | |
| | | 1,800 ~ 3,000 | -65 | |
| | | 3,000 ~ 6,000 | -65 | |
| | | 6,000 | -73 | |
| 6 | Output RF Spectrum (due to switching transient) | **GSM850/EGSM** | | |
| | | Offset from Carrier (kHz) | Max. (dBm) | |
| | | 400 | -19 | |
| | | 600 | -21 | |
| | | 1,200 | -21 | |
| | | 1,800 | -24 | |
| | | **DCS1800/PCS1900** | | |
| | | Offset from Carrier (kHz) | Max. (dBm) | |
| | | 400 | -22 | |
| | | 600 | -24 | |
| | | 1,200 | -24 | |
| | | 1,800 | -27 | |

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| 7 | Spurious Emissions | Conduction, Emission Status<br>Conduction, Emission Status | | |
|---|---|---|---|---|
| 8 | Bit Error Ratio | <span style="color:red">EGSM/GSM850</span><br>    BER (Class II) < 2.439% @-102dBm<br>DCS1800/PCS1900<br>    BER (Class II) < 2.439% @-102dBm | | |
| 9 | Rx Level Report accuracy | ± 3 dB | | |
| 10 | SLR | 8 ± 3 dB | | |
| 11 | Sending Response | Frequency (Hz) | Max.(dB) | Min.(dB) |
| | | 100 | -12 | / |
| | | 200 | 0 | / |
| | | 300 | 0 | -12 |
| | | 1,000 | 0 | -6 |
| | | 2,000 | 4 | -6 |
| | | 3,000 | 4 | -6 |
| | | 3,400 | 4 | -9 |
| | | 4,000 | 0 | / |
| 12 | RLR | 2 ± 3 dB | | |
| 13 | Receiving Response | Frequency (Hz) | Max.(dB) | Min.(dB) |
| | | 100 | -12 | / |
| | | 200 | 0 | / |
| | | 300 | 2 | -7 |
| | | 500 | * | -5 |
| | | 1,000 | 0 | -5 |
| | | 3,000 | 2 | -5 |
| | | 3,400 | 2 | -10 |
| | | 4,000 | 2 | |
| | | * Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range. | | |
| 14 | STMR | 13 ± 5 dB | | |
| 15 | Stability Margin | > 6 dB | | |
| 16 | Distortion | dB to ARL (dB) | Level Ratio (dB) | |
| | | -35 | 17.5 | |
| | | -30 | 22.5 | |
| | | -20 | 30.7 | |
| | | -10 | 33.3 | |
| | | 0 | 33.7 | |
| | | 7 | 31.7 | |
| | | 10 | 25.5 | |

| 17 | Side tone Distortion | Three stage distortion < 10% | |
|---|---|---|---|
| 18 | <Change> System frequency (26 MHz) tolerance | ≤ 2.5 ppm | |
| 19 | <Change>32.768KHz tolerance | ≤ 30ppm | |
| 20 | Power consumption | Standby<br>- Normal, ≤ 3.8 mA(@PP5) | |
| 21 | Talk Time | EGSM/Lvl 7(Battery Capacity 1500mA):450 min<br>EGSM/Lvl12(Battery Capacity 1500 mA):630min | |
| 22 | Standby Time | Under conditions, at least 390 hours:<br>1. Brand new and full 1500mAh battery<br>2. Full charge, no receive/send and keep GSM in idle mode.<br>3. Broadcast set off.<br>4. Signal strength display set at 3 level above.<br>5. Backlight of phone set off. | |
| 23 | Ringer Volume | At least 65 dB under below conditions:<br>1. Ringer set as ringer.<br>2. Test distance set as 50 cm | |
| 24 | Charge Current | Normal charging : 680 mA | |
| 25 | Antenna Display | Antenna Bar Number | Power |
| | | 7 | >-92 dBm ~ |
| | | 5 | -97dBm ~ −93dBm |
| | | 4 | -100dBm ~ −98dBm |
| | | 2 | -103dBm ~ −101dBm |
| | | 1 | -105dBm ~ −104dBm |
| | | 0 | < −106 dBm |
| | | Off | No Service |
| 26 | Battery Indicator | Battery Bar Number | Voltage (±0.05V) |
| | | 3 | 3.69V~4.2V |
| | | 2 | 3.53V~3.69V |
| | | 1 | 3.43V~3.53V |
| | | 0 | 3.35V~3.43V |
| 27 | Low Voltage Warning | 3.53V↓±0.05V (Call)<br>3.43V↓±0.05V (Standby) | |

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| 28 | Forced shut down Voltage | $3.3 \pm 0.05$ V |
|----|--------------------------|------------------|
| 29 | Battery Type | Li-Polymer Battery<br>Standard Voltage = 3.7 V<br>Battery full charge voltage = 4.2 V<br>Capacity: 1500mAh |
| 30 | Travel Charger | Switching-mode charger<br>Input: 150 ~ 240 V, 50/60Hz<br>Out put: 5.1, 0.7A |

## * EDGE RF Specification (Option:   is not serviced for "EDGE mode")

| Item | Description | Specification | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | RMS EVM | ≤9% | | | | | |
| 2 | Peak EVM | ≤30% | | | | | |
| 3 | 95th Percentile EVM | ≤15% | | | | | |
| 4 | Origin Offset Suppression | ≥30dB | | | | | |
| 5 | Power Level | **GSM850/EGSM** | | | | | |
| | | Level | Power | Toler. | Level | Power | Toler. |
| | | 5 | 27dBm | ±3dB | 13 | 17dBm | ±3dB |
| | | 6 | 27dBm | ±3dB | 14 | 15dBm | ±3dB |
| | | 7 | 27dBm | ±3dB | 15 | 13dBm | ±3dB |
| | | 8 | 27dBm | ±3dB | 16 | 11dBm | ±5dB |
| | | 9 | 25dBm | ±3dB | 17 | 9dBm | ±5dB |
| | | 10 | 23dBm | ±3dB | 18 | 7dBm | ±5dB |
| | | 11 | 21dBm | ±3dB | 19 | 5dBm | ±5dB |
| | | 12 | 19dBm | ±3dB | | | |
| | | **DCS1800, PCS1900** | | | | | |
| | | Level | Power | Toler. | Level | Power | Toler. |
| | | 0 | 26/25dBm | ±3dB | 8 | 14dBm | ±3dB |
| | | 1 | 26/25dBm | ±3dB | 9 | 12dBm | ±4dB |
| | | 2 | 26/25dBm | ±3dB | 10 | 10dBm | ±4dB |
| | | 3 | 24dBm | ±3dB | 11 | 8dBm | ±4dB |
| | | 4 | 22dBm | ±3dB | 12 | 6dBm | ±4dB |
| | | 5 | 20dBm | ±3dB | 13 | 4dBm | ±4dB |
| | | 6 | 18dBm | ±3dB | 14 | 2dBm | ±5dB |
| | | 7 | 16dBm | ±3dB | 15 | 0dBm | ±5dB |
| 6 | Output RF Spectrum (due to modulation) | **GSM850/EGSM** | | | | | |
| | | Offset from carrier(kHz) | | Max. dBc | | | |
| | | 100 | | +0.5 | | | |
| | | 200 | | -30 | | | |
| | | 250 | | -33 | | | |
| | | 400 | | -54 | | | |
| | | 600~<1,200 | | -60 | | | |
| | | 1,200~<1,800 | | -60 | | | |
| | | 1,800~<3,000 | | -63 | | | |
| | | 3,000~<6,000 | | -65 | | | |
| | | 6,000 | | -71 | | | |

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| 6 | | **DCS1800, PCS1900** | |
|---|---|---|---|
| | | Offset from carrier(kHz) | Max. dBc |
| | | 100 | +0.5 |
| | | 200 | -30 |
| | | 250 | -33 |
| | | 400 | -54 |
| | | 600~<1,200 | -60 |
| | | 1,200~<1,800 | -60 |
| | | 1,800~<3,000 | -63 |
| | | 3,000~<6,000 | -65 |
| | | 6,000 | -71 |
| 7 | Output RF Spectrum (due to switching transient) | **GSM850/EGSM** | |
| | | Offset from carrier(kHz) | Max. dBm |
| | | 400 | -23 |
| | | 600 | -26 |
| | | 1,200 | -27 |
| | | 1,800 | -30 |
| | | **DCS1800, PCS1900** | |
| | | Offset from carrier(kHz) | Max. dBm |
| | | 400 | -23 |
| | | 600 | -26 |
| | | 1,200 | -27 |
| | | 1,800 | -30 |

# 3. TECHNICAL BRIEF

## 3.1 GX500 Functional Block diagram

The functional component arrangement is mentioned below diagram.



**Figure 3-1. GX500 Functional Block diagram**
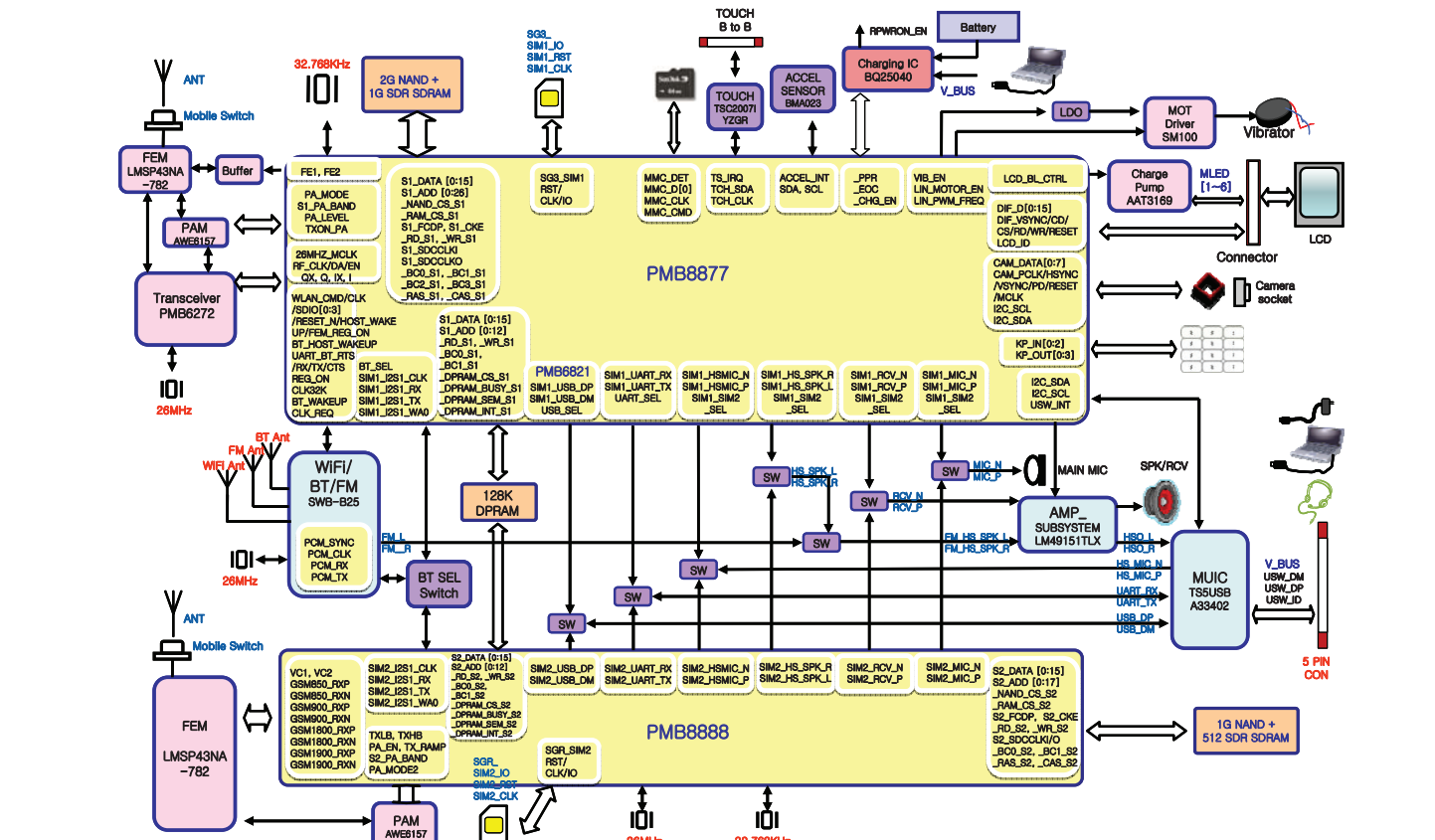
## 3.2 Dual Baseband Processor (BBP) Introduction

GX500 is composed of dual Baseband Processor. (S-Gold3 & S-Gold Radio)

### 3.2.1 S-Gold3 Part
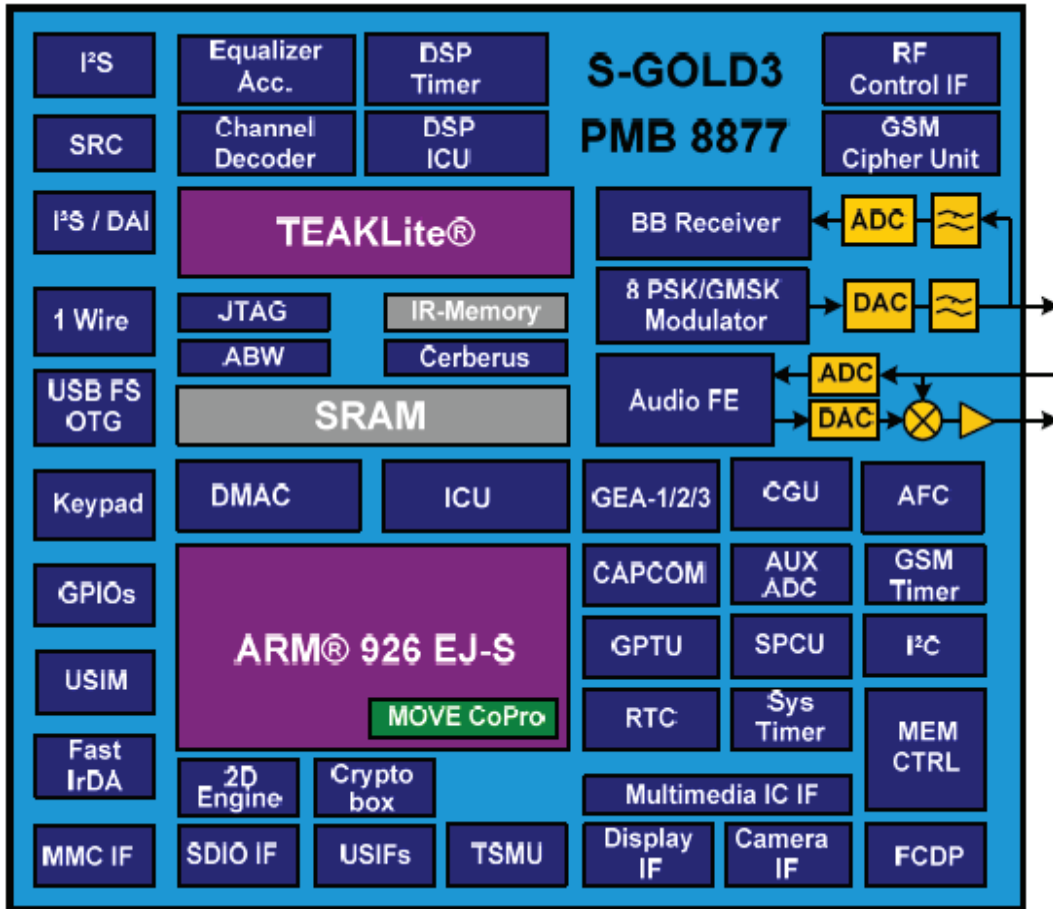


**Figure3- 2. Top level block diagram of the S-GOLD3™ (PMB8877)**

### 3.2.1.1 General Description

S-GOLD3™ is a GSM/EDGE single chip mixed signal Baseband IC containing all analog and digital functionality of a cellular radio. Additionally S-GOLD3™ Provides multimedia extensions such as camera, software MIDI, MP3 sound. It is designed as a single chip solution, integrating the digital and mixed signal portions of the base band in 0.09um, 1.2V technology.
The chip will fully support the FR, EFR, HR and AMR-NB vocoding.
S-GOLD3™ support multi-slot operation modes HSCSD (up to class 10), GPRS for high speed data application (up to class 12) and EGPRS (up to class 12) without additional external hardware.

### 3.2.1.2 Block Description

● **Processing core**
   ARM926EJ-S 32 bit processor core for controller functions. The ARM926EJ-S includes an MMU, and the Jazelle Java extension for Java acceleration.
   - TEAKLite DSP core

● **ARM-Memory**
   - 32k Byte Boot ROM on the AHB
   - 96k Byte SRAM on the AHB, flexibly usable as program or data RAM
   - 16k Byte Cache for Program (internal)
   - 8k Byte tightly coupled memory for Program(internal)
   - 8k Byte Cache for Data(internal)
   - 8k Byte tightly coupled memory for Data(internal)

● **DSP-Memory**
   - 104K x 16bit Program ROM
   - 8k x 16bit Program RAM
   - 60k x 16bit Data ROM
   - 37k x 16bit Data RAM
   - Incremental Redundancy(IR) Memory of 35904 words of 16bit

● **Shared Memory Block**
   1.5K x 32bit Shared RAM(dual ported) between controller system and TEAKLite.

● **Controller Bus system**
   The processor cores and their peripherals are connected by powerful buses.
   Multi-layer AHB for connecting the ARM and the other master capable building blocks with the internal and external memories and with the peripheral buses.

● **Clock system**
   The clock system allows widely independent selection of frequencies for the essential parts of the S-GOLD3.
   Thus power consumption and performance can be optimized for each application.

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- **Functional Hardware block**
  - CPU and DSP Timers
  - MOVE coprocessor performing motion estimation for video encoding algorithms (H.263, MPEG-4)
  - Programmable PLL with additional phase shifters for system clock generation
  - GSM Timer Module that off-loads the CPU from radio channel timing
  - GMSK / 8-PSK Modulator according to GSM-standard 05.04 (5/2000)
  - GMSK Modulator: gauss-filter with B*T=0.3
  - EDGE Modulator: 8PSK-modulation with linearized GMSK-Pulse-Filter
  - Hardware accelerators for equalizer and channel decoding.
  - Incremental Redundancy memory for EDGE class 12 support
  - A5/1, A5/2, A5/3 Cipher unit
  - GEA1, GEA2, GEA3 Cipher Unit to support GPRS data transmission
  - Advanced static and dynamic power management features including TDMA-Frame synchronous low power mode and enhanced CPU modes(idle and sleep modes)
  - Pulse Number Modulation output for Automatic Frequency Correction(AFC)
  - Serial RF Control interface: support of direct conversion RF
  - A Universal Serial Interface(USIF) enabling asynchronous (UART) of synchronous (SPI) serial data transmission
  - 3 USIF with autobaud detection, hardware flow control and integrated
  - A dedicated Fas IfDA Controller supporting IrDA's SIR,MIR and FIR standards (up to 4Mbps)
  - I2C-bus interface (e.g. connection to S/M power)
  - A fast display interface supporting serial and parallel interconnection
  - An ITU-R BT.656 compatible Camera interface.
  - Programmable clock output for a camera
  - An multimedia/Secure Digital Card Interface (MMCI/SD:SDIO capable)

### 3.2.1.3 External Devices connected to memory interface

**Table 3-1. Memory interface**

| Device | Name | Maker | Remark |
|---|---|---|---|
| NAND FLASH | H8ACS0SJ0MCP-56M | Hynix | |
| SDR | H8ACS0SJ0MCP-56M | Hynix | |
| LCD | | | |
| DPRAM | | | |

### 3.2.1.4 RF Interface (T_OUT)

S-Gold3 uses this interface to control RF IC and Peripherals. 13 signals are provided switch on/off RF ICs Periodically each TDMA frame.

**Table 3-2. RF Interface Spec.**

| T_OUT | | |
|---|---|---|
| **Resource** | **Interconnection** | **Description** |
| T_OUT0 | TXON_PA | PAM Power on |
| T_OUT1 | FE2 | FEM Control |
| T_OUT2 | PA_BAND | TX RF band select |
| T_OUT3 | FE1 | FEM control |
| T_OUT6 | PA_MODE | PAM Mode select |

### 3.2.1.5 USIF Interface

GX500 have three USIF Drivers as follow :
- USIF1 : Hardware Flow Control / SW upgrade / Calibration
- USIF2 : Not used Rx, Tx and CTS, RTS use BT Interface
- USIF3 : BT Interface

**Table 3-3. USIF Interface Spec.**

| Resource | Name | Remark |
|---|---|---|
| **USIF1** | | |
| USIF1_TXD | SIM1_UART_TX | Transmit Data |
| USIF1_RXD | SIM1_UART_RX | Receive Data |
| USIF1_CTS | USB_SE0_VM | USB |
| USIF1_RTS | USB_DAT_VP | USB |
| **USIF2** | | |
| USIF2_CTS | SIM1_BT_CTS | BlueTooth |
| USIF2_RTS | SIM1_BT_RTS. | BlueTooth |
| **USIF3** | | |
| USIF3_TXD | SIM1_BT_TX | BT Transmit tx |
| USIF3_RXD | SIM!_BT_RX | BT Receive rx |

### 3.2.1.6 ADC channel

BBP ADC block is composed of 10 external ADC channel. This block operates charging process and other related process by reading battery voltage and other analog values.

**Table 3-4. S-Gold3 ADC channel usage**

| ADC channel | | |
|---|---|---|
| **Resource** | **Interconnection** | **Description** |
| M0 | BAT_ID | Battery temperature measure |
| M1 | RF_TEMP | RF block temperature measure |
| M8 | VSUPPLY | Battery supply voltage measure |

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### 3.2.1.7 GPIO map

Over a hundred allowable resources, GX500 is using as follows except dedicated to SIM and Memory. GX500 GPIO(General Purpose Input/Output) Map, describing application, I/O state, and enable level, is shown in below table

**Table 3-5 S-Gold3 GPIO pin Map**

| Port function | Signal Name | Reset Value | Description |
|---|---|---|---|
| #Keypad | | | |
| KP_IN0 | KEY_ROW0 | T/PU | |
| KP_IN1 | KEY_ROW1 | T/PU | |
| KP_IN4 | KEY_ROW4 | T/PU | |
| GPIO_03 | HSMIC_BIAS_EN | T/PU | |
| CC0CC4IO | CHG_DET | T/PU | "Falling Edge" INT on TA |
| CC1CC0IO | MMC_DET | T/PU | "Falling Edge" INT |
| CC1CC4IO | ACCEL_INT | T/PU | For Accel Sensor |
| KP_OUT0 | KEY_COL0 | T/PU | |
| KP_OUT1 | KEY_COL1 | T/PU | |
| KP_OUT2 | KEY_COL2 | T/PU | |
| KP_OUT3 | KEY_COL3 | T/PU | |
| #USIF1: Universal Serial IF #USB | | | |
| USIF1_RXD_MRST | SIM1_UART_RX | T/PD | |
| USIF1_TXD_MTSR | SIM1_UART_RX | T/PD | |
| USIF1_RTS_N | USB_DAT_VP | T/PU | |
| USIF1_CTS_N | USB_SE0_VM | T/PD | |
| | | | |
| GPIO_15 | BT_SEL | T/PU | |
| GPIO_16 | USB_SEL | T/PD | |
| USIF2_RTS_N | SIM1_BT_RTS | T/PD | |
| USIF2_CTS_N | SIM1_BT_CTS | T/PD | |
| | | | |
| USIF3_RXD_MRST | SIM1_BT_RX | T/PD | |
| USIF3_TXD_MTSR | SIM1_BT_TX | T/PD | |
| GPIO_21 | SGR_PWR_ON | T/PD | "High" Enable |
| | | | |
| MMCI2_CMD | MMC_CMD | T/PD | |
| MMCI2_DAT[0] | MMC_D0 | T/PD | |
| MMCI2_CLK | MMC_CLK | T/PD | |
| | | | |
| CIF_D0 | CIF_D0 | T/PD | |
| CIF_D1 | CIF_D1 | T/PD | |
| CIF_D2 | CIF_D2 | T/PD | |

| | | | |
|---|---|---|---|
| CIF_D3 | CIF_D3 | T/PD | |
| CIF_D4 | CIF_D4 | T/PD | |
| CIF_D5 | CIF_D5 | T/PD | |
| CIF_D6 | CIF_D6 | T/PD | |
| CIF_D7 | CIF_D7 | T/PD | |
| CIF_PCLK | CIF_PCLK | T/PD | |
| CIF_HSYNC | CIF_HSYNC | T/PD | |
| CIF_VSYNC | CIF_VSYNC | T/PD | |
| CLKOUT2 | CIF_MCLK | T/PD | |
| CIF_PD | CIF_PD | T/PD | |
| CIF_RESET | CIF_RESET | T/PD | |
| #Display_Interface | | | |
| DIF_D0 | DIF_D0 | T/PD | |
| DIF_D1 | DIF_D1 | T/PD | |
| DIF_D2 | DIF_D2 | T/PD | |
| DIF_D3 | DIF_D3 | T/PD | |
| DIF_D4 | DIF_D4 | T/PD | |
| DIF_D5 | DIF_D5 | T/PD | |
| DIF_D6 | DIF_D6 | T/PD | |
| DIF_D7 | DIF_D7 | T/PD | |
| GPIO_109 | MIC_BIAS_EN | T/PD | "High" Enable |
| DIF_CS1 | DIF_CS | T/PU | |
| GPIO_96 | TOUCH_EN | T/PU | |
| DIF_CD | DIF_CD | T/PU | |
| DIF_WR | DIF_WR | T/PU | |
| DIF_RD | DIF_RD | T/PU | |
| EINT7 | USW_INT | T/PD | |
| DIF_VD | DIF_VSYNC | T/PD | |
| GPIO_27 | DIF_RESET | T/PD | |
| GPIO_101 | LCD_BL_CTRL | T/PD | |
| #I2C1 | | | |
| I2C1_SCL | SCL | T | |
| I2C1_SDA | SDA | T | |
| PM_INT | PM_INT | # | |
| #I2C2 | | | |
| I2C2_SCL | CODEC_SCL | T | |
| I2C2_SDA | CODEC_SDA | T | |
| #Chip Card (USIM1) | | | |
| CC_IO | SG3_SIM1_IO | L | |
| CC_CLK | SG3_SIM1_CLK | L | |
| CC_RST | SG3_SIM1_RST | L | |
| | | | |
| GPIO_110 | USB_OEn | T/PD | |
| EINT3 | BT_HOST_WAKEUP | T/PU | |

LGE Internal Use Only

| | | | |
|---|---|---|---|
| SWIF_TXRX | | T/PU | Not Used |
| | | | |
| MMCI1_CMD | WLAN_CMD | T/PD | |
| MMCI1_DAT[0] | WLAN_SDIO[0] | T/PD | |
| MMCI1_CLK | WLAN_CLK | T/PD | |
| | | | |
| MMCI1_DAT[1] | WLAN_SDIO[1] | T/PD | |
| MMCI1_DAT[2] | WLAN_SDIO[2] | T/PD | |
| MMCI1_DAT[3] | WLAN_SDIO[3] | T/PD | |
| | | | |
| I2S1_CLK0 | SIM1_I2S1_CLK | T/PD | |
| GPIO_112 | RPWRON | T/PD | |
| I2S1_RX | SIM1_I2S1_RX | T/PD | |
| I2S1_TX | SIM1_I2S1_TX | T/PD | |
| I2S1_WA0 | SIM1_I2S1_WA0 | T/PD | |
| | | | |
| EINT4 | _EOC | T/PD | End Of Charge |
| GPIO_102 | LCD_ID | T/PD | |
| CC0CC1IO | _PPR | T/PD | USB/TA Charger Insert |
| GPIO_33 | SG3_INT | T/PD | To SGR |
| CC0CC3IO | VIB_PWM | T/PD | T0 timer (PWM) |
| GPIO_103 | NA | T/PD | |
| | | | |
| EPN1 | EAR_N | | |
| EPP1 | EAR_P | | |
| EPPA1 | BB_SND_L | | |
| EPREF | | | |
| EPPA2 | BB_SND_R | | |
| MICN1 | SIM1_MIC_N | | |
| MICP1 | SIM1_MIC_P | | |
| MICN2 | SIM1_HSMIC_N | | |
| MICP2 | SIM1_HSMIC_P | | |
| AUXN1 | GND | | Connected to GND |
| AUXP1 | GND | | Connected to GND |
| AUXN2 | GND | | Connected to GND |
| AUXP2 | GND | | Connected to GND |
| AUXGND | | | |
| VMICP | TP 116 | | Not Used |
| VMICN | GND | | Connected to GND |
| #I/Q-Signale: Analog Interface, Baseband | | | |
| PAOUT1 | PA_LEVEL | | |
| BB_I | I | | |

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| BB_IX | IX | | |
|---|---|---|---|
| BB_Q | Q | | |
| BB_QX | QX | | |
| #Measurement | | | |
| M_0 | BAT_ID | | |
| M_1 | S1_RF_TEMP | | |
| M_2 | | | |
| M_3 | TP 101 | | Not Used |
| M_4 | | | Not Used |
| M_5 | | | |
| M_6 | | | |
| M_7 | TP 105 | | Not Used |
| M_8 | VSUPPLY | | |
| M_9 | | | |
| M_10 | | | |
| | | | |
| | VREFN | | |
| | | | |
| #JTAG | | | |
| TDO | S1_TDO | T | |
| TDI | S1_TDI | PU | |
| TMS | S1_TMS | PU | |
| TCK | S1_TCK | PD | |
| TRST_n | S1_TRSTn | PD | |
| RTCK | S1_RTCK | L | |
| #Debug | | | |
| TRIG_IN | S1_TRIG_IN | PD/Latched | |
| MON1 | 2V62_VIO | PD/Latched | config pins (MON1, MON2, TRIG_IN) according to memory types => NAND 8-bit |
| MON2 | | PD/Latched | |
| TRACESYNC | TRACESYNC | L | |
| TRACECLK | TRACECLK | L | |
| PIPESTAT[2] | PIPESTAT2 | H | |
| PIPESTAT[1] | PIPESTAT1 | H | |
| PIPESTAT[0] | PIPESTAT0 | H | |
| TRACEPKT[0] | TRACEPKT0 | L | |
| TRACEPKT[1] | TRACEPKT1 | L | |
| TRACEPKT[2] | TRACEPKT2 | L | |
| TRACEPKT[3] | TRACEPKT3 | L | |
| TRACEPKT[4] | TRACEPKT4 | L | |
| TRACEPKT[5] | TRACEPKT5 | L | |
| TRACEPKT[6] | TRACEPKT6 | L | |
| TRACEPKT[7] | TRACEPKT7 | L | |

|  |  |  |  |
|---|---|---|---|
|  |  | # | TP 106 |
|  | S1_ADD(31) | H |  |
|  | _RD_S1 | H |  |
|  | S1_DATA(0) | T/PD |  |
|  | S1_DATA(1) | T/PD |  |
|  | S1_DATA(2) | T/PD |  |
|  | S1_DATA(3) | T/PD |  |
|  | S1_DATA(4) | T/PD |  |
|  | S1_DATA(5) | T/PD |  |
|  | S1_DATA(6) | T/PD |  |
|  | S1_DATA(7) | T/PD |  |
|  | S1_DATA(8) | T/PD |  |
|  | S1_DATA(9) | T/PD |  |
|  | S1_DATA(10) | T/PD |  |
|  | S1_DATA(11) | T/PD |  |
|  | S1_DATA(12) | T/PD |  |
|  | S1_DATA(13) | T/PD |  |
|  | S1_DATA(14) | T/PD |  |
|  | S1_DATA(15) | T/PD |  |
|  | _NAND_CS_S1 | H |  |
|  | _RAM_CS_S1 | H |  |
|  | _DPRAM_CS_S1 | H |  |
|  |  | H |  |
|  | _WR_S1 | H |  |
|  | S1_ADD(16) | L |  |
|  | S1_ADD(17) | L |  |
|  | S1_ADD(18) | L |  |
|  | S1_ADD(19) | L |  |
|  | S1_ADD(20) | L |  |
|  | S1_ADD(21) | L |  |
|  | S1_ADD(22) | L |  |
|  | S1_ADD(23) | L |  |
|  | S1_ADD(24) | L |  |
|  | S1_ADD(25) | L |  |
|  | S1_ADD(26) | L |  |
|  | S1_ADD(27) | H |  |

| | S1_ADD(28) | H | |
|---|---|---|---|
| | S1_ADD(29) | H | |
| | S1_ADD(30) | H | |
| | | L | |
| | S1_SDCLKI | T | |
| | S1_SDCLKO | H | |
| | _BC0_S1 | H | |
| | _BC1_S1 | H | |
| | _BC2_S1 | H | |
| | _BC3_S1 | H | |
| | S1_ADD(0) | T/PD | |
| | S1_ADD(1) | T/PD | |
| | S1_ADD(2) | T/PD | |
| | S1_ADD(3) | T/PD | |
| | S1_ADD(4) | T/PD | |
| | S1_ADD(5) | T/PD | |
| | S1_ADD(6) | T/PD | |
| | S1_ADD(7) | T/PD | |
| | S1_ADD(8) | T/PD | |
| | S1_ADD(9) | T/PD | |
| | S1_ADD(10) | T/PD | |
| | S1_ADD(11) | T/PD | |
| | S1_ADD(12) | T/PD | |
| | S1_ADD(13) | T/PD | |
| | S1_ADD(14) | T/PD | |
| | S1_ADD(15) | T/PD | |
| | _RAS_S1 | H | |
| | _CAS_S1 | H | |
| | S1_CKE | L | |
| | | | |
| FCDP_RBn | S1_FCDP | T/PU | |
| | | | |
| FWP | _DPRAM_SEM_S1 | T/PU | |
| | | | |
| T_OUT0 | TXON_PA | T/PD/Latched | |
| GPIO_44 | WLAN_WAKEUP | T/PD/Latched | WIFI |
| T_OUT2 | S1_PA_BAND | T/PD/Latched | |
| GPIO_46 | WLAN_ENABLE | T/PD | WIFI |
| GPIO_47 | | T/PU | NA |

| | | | |
|---|---|---|---|
| CC1CC1IO | SGR_INT | T/PD | from SGR |
| T_OUT6 | PA_MODE | T/PD | |
| GPIO_50 | SGR_Resetn | T/PD/Latched | SGR RESET 제외하고 항상 HIGH 이어야 함 |
| GPIO_51 | UART_SEL | T/PD/Latched | |
| GPIO_52 | LIN_MOTOR_EN | T/PD/Latched | MOTOR DRIVER IC CONTROL |
| CC1CC7IO | WLAN_HOST_WAKE UP | T/PU/Latched | WIFI |
| GPIO_54 | SIM_SWITCH | T/PD | |
| GPIO_55 | _CHG_EN | T/PD | Charging IC Enable & control |
| #SPCU | | | |
| GPIO_117 | SIM1_SIM2_SEL | T/PD | |
| GPIO_118 | BT_ENABLE | T/PD | WIFI |
| SPCU_RC_OUT0 | VCXO_EN | H | |
| SPCU_RQ_IN2 | RESOURCE_CTRL | T/PD | |
| #RF Control Unit | | | |
| RF_STR0 | RF_EN | T/PD | |
| GPIO_57 | _DPRAM_BUSY_S1 | T/PD/Latched | |
| RF_DATA | RF_DA | L | |
| RF_CLK | RF_CLK | L | |
| #Other Functional Pins: Clocks and control | | | |
| AFC | AFC | T | |
| EINT1 | _DPRAM_INT_S1 | T/PD | 1.8V Power Domain |
| F26M | 26MHZ_MCLK | # | |
| F32K | | # | Connected to 32KHz |
| OSC32K | | # | Connected to 32KHz |
| RESET_n | _RESET | # | |
| GPIO_59 | SIM1_DSR | T | |
| RTC_OUT | RTC_OUT | # | TP 110 |
| | | | |
| CLK32K | CLK32K | T/PD | WIFI |
| DSPOUT1 | WDOG | T/PD | |
| GPIO_63 | BT_WAKEUP | T/PU | WIFI |

## 3.2.2 S-Gold Radio Part
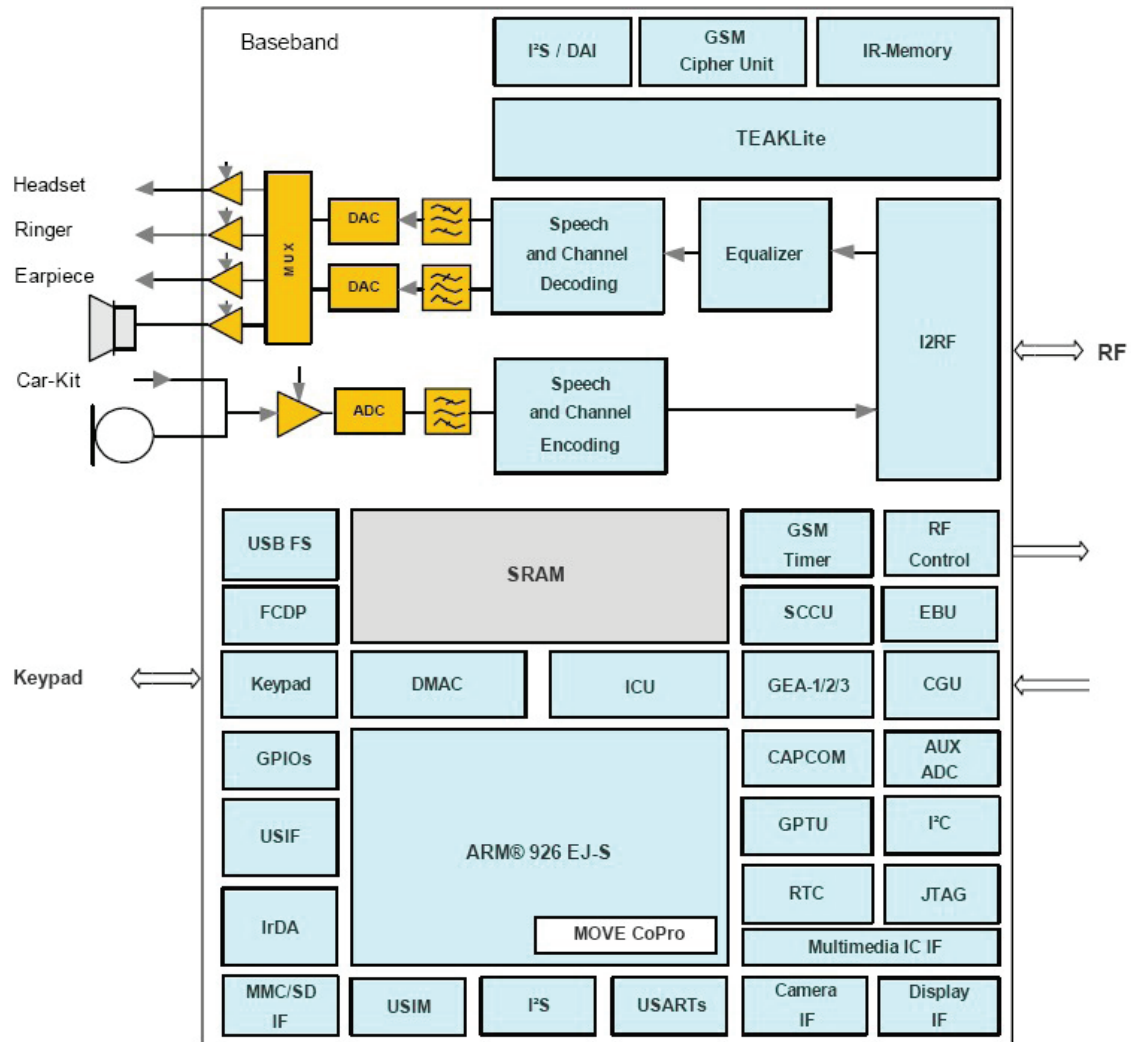


**Figure 3-3. S-Gold Radio Circuit Diagram of GX500**

# 3. TECHNICAL BRIEF

### 3.2.2.1 Block Description

**Connectivity**

S-GOLDradio™ offers a variety of connectivity options common in today's feature phone applications:

• USB 2.0 Full Speed (12 Mbps)

• IrDA Controller

Supports Infrared SIR Mode Transceivers

• RS-232 over a 16C550 compliant UART

• MMC/SD Memory Card Interface

– Low Voltage Capable

– SDIO expandable (using external components)

• Ready to connect to the Infineon's Bluemoon Family Bluetooth Transceivers

– HCI (H5) optimized USIF (Universal Serial Interface)

– Dedicated PCM-style digital audio interface (I2S)

– Dedicated power supply

• Microcontroller-Like Extension Interface

For multimedia companions (for example, complex display/camera modules or graphic accelerators)

• External Memory Interface

Supporting:

– SDRAM

– Cellular RAM

– Burst Flash

– SRAM

– NAND flashes (error correction capability in HW)

• User Interface (Keypad)

Supporting up to 74 keys with multiple key-press capability

• SIM Card interface (USIM)

ISO 7816 compatible

• Analogue Measurement Unit

For various general purpose measurements such as battery voltage, battery, VCXO and environmental temperature, battery technology, transmission power, offset, on-chip temperature, etc.

**Security**

S-GOLDradio™ has the following security features:

• Secure Boot and Flash Update

• SHA1 HW acceleration

• Secure Debug

• 128-bit customer defined efuse key

• Anti-intrusion logic.

**Audio**

Besides the telephony voice CODECs supplied by the Firmware running on the TEAKLite® DSP core, the ARM926 core enables running high-quality audio CODECs such as MPEG-1/2 Layer-3 Decode (MP3), AAC+ or AAC++. Audio streaming is supported according to the 3GPP PSS Release 4 standard.
The output of audio and voice codecs can be mixed and routed to the integrated Hi-Fi Stereo voiceband supporting CD-Quality. Alternatively, the audio can also be sinked to a mono loudspeaker using the integrated hands-free amplifier.

**Video and Imaging**

S-GOLDradio™ allows connecting an external camera module over an ITU-R BT656 compliant interface and a display module over a microcontroller-like parallel or serial interface. Furthermore, ARM's MOVE coprocessor is integrated to accelerate video encoding algorithms (for example, H.263 or MPEG-4). This fulfills basic multimedia requirements and allows connecting commodity cameras and displays without the need of an additional multimedia IC. The computational power for encoding and decoding still pictures (JPEG) and video sequences (H.263 or MPEG-4) is provided by the integrated ARM926 core. Over-the-air interface JPEG pictures and H.263 or MPEG-4 videos can be sent or received as MMS by means of (E)GPRS.
S-GOLDradio™ also enables video down-streaming because of its DSP and ARM performances.
Supported "still pictures" multimedia scenarios are:

• **View Finding for a Picture Snapshot:** Captured frames are transferred from the camera IF to the display IF at up to15 fps (depending on the camera used) in QCIF resolution (depending on the display used). Downscaling and color conversion is done by the camera and display interface logic. Therefore, view finding for a snapshot is possible without burdening the CPU. However, picture rotation and/or overlay are performed by SW if required.

• **Shooting:** The captured picture, with up to 1.31 MPixel resolution (SXGA 1280 x 1024), is transferred within 1/15 sec to external memory.[1] Then, JPEG compression is done by SW, while the viewfinder is frozen so that the user can immediately see the snapshot on the display.

• **Photo Flash:** Under low light conditions usually a photo flash is required. To activate the flash at the right time, a general purpose timer unit (GTPU) can be used that is triggered by the frame synchronization signal (VSYNC) from the camera interface.

• **Processing:** JPEG thumbnail generation, picture overlay, picture rotation and other picture processing tasks are performed by SW.

• **Viewing:** A JPEG picture is decoded, down-scaled and format converted by SW and then transferred to the display interface. JPEG thumbnails can also be transferred directly to the display interface after decoding by SW without additional downscaling.

• **Storage:** JPEG pictures can be stored on an MMC/SD card, a Flash or a PC.

• **Sending/Receiving:** JPEG thumbnails can be sent/received as MMS (E-GPRS). Full resolution JPEG pictures can be sent/received as e-mail or downloaded from the internet.

Supported "video sequence" multimedia scenarios:

• **Record Video Sequences:** Captured frames in QCIF resolution are transferred to internal memory at 15 fps. H.263 or MPEG-4 encoding is performed on-the-fly by SW with the support of the MOVE coprocessor.

# 3. TECHNICAL BRIEF

The audio recording is performed on the DSP (GSM AMR CODEC). Multiplexing of audio and video streams is performed by the ARM.

• **View Finding during Video Encoding:** During video recording the user needs to see what is being recorded. Therefore, the captured frames are not only encoded but also transferred to the display interface. If only every second frame from the camera is used for encoding, viewfinding is possible without burdening the CPU. However, if each frame from the camera has to be encoded, due to low camera frame rate, the YCbCr4:2:2 to YCbCr4:4:4 color conversion and further downscaling is performed by SW. Picture rotation and overlay has to be done in SW in any case.

• **Storage**: Compressed H.263 or MPEG-4 videos can be stored on an MMC/SD, a Flash or a PC.

• **Viewing:** De-multiplexing of audio and video streams is performed by the ARM. The H.263 or MPEG-4 decoding is also done by SW on the ARM and then the frames are transferred to the display interface. Audio decoding (GSM-AMR) is done on the DSP.

The audio/video synchronization is done by time stamp feedback from the DSP to the ARM.

• **Sending/Receiving:** H.263 or MPEG-4 videos can be sent/received as MMS (E-GPRS), as e-mail or downloaded from the internet.

**Higher Multimedia Performance**

If higher multimedia performance is required, an external multimedia IC can be connected to S-GOLDradioTM because it contains a multimedia IC interface module. The camera and display interface pins are used in a multiplex mode to connect an external multimedia IC to the S-GOLDradioTM multimedia IC interface module. The display and camera are connected to the multimedia IC, which contains functions (in HW and/or SW) to process still images and video data. This configuration is intended for higher-end graphics features (for example, high quality video streaming, video conferencing, hardware-assisted 2D/3D graphics functions, etc.).

## 3.2.2.2 External Devices connected to memory interface

**Table 3-6 Memory interface**

| Device | Name | Maker | Remark |
|---|---|---|---|
| NAND FLASH | K5D1H12ACC-A075 | SAMSUNG | 1G(64Mx16) NAND |
| SDRAM | K5D1H12ACC-A075 | SAMSUNG | 512M(16Mx16) SDRAM |

### 3.2.2.3 RF Interface

S-GOLDradio uses this interface to control RF IC and Peripherals. 6 signals are provided switch on/off RF ICs Periodically each TDMA frame.

**Table 3-7 RF Interface Spec.**

| T_OUT | | |
|---|---|---|
| **Resource** | **Interconnection** | **Description** |
| PABS | S2_PA_BAND | TX RF band select |
| T_OUT6 | PA_MODE_2 | PAM Mode select |
| FE1 | VC1 | FEM control |
| FE2 | VC2 | FEM control |
| PAEN | PA_EN | PAM Power on |
| VRAMP | TX_RAMP | APC |

### 3.2.2.4 USART Interface

GX500(SGold Radio Part) has a UART Driver as follow :
- USART1 : Hardware Flow Control / SW upgrade / Calibration

**Table 3-8 USART Interface Spec.**

| USART_0(USART1) | | |
|---|---|---|
| **Resource** | **Name** | **Remark** |
| USART0_TXD | SIM2_UART_TX | Transmit Data |
| USART0_RXD | SIM2_UART_RX | Receive Data |

### 3.2.2.5 ADC channel

SGold Radio ADC block is composed of 7 external ADC channel. This block operates charging process and other related process by reading battery voltage and other analog values.

**Table 3-9 S-GOLDradio ADC channel usage**

| ADC channel | | |
|---|---|---|
| **Resource** | **Interconnection** | **Description** |
| M0 | BAT_ID | Battery IC check |
| M1 | RF_TEMP | RF block temperature measure |
| M8 | VSUPPLY | Battery supply voltage measure |

### 3.2.2.6 GPIO map

Over a hundred allowable resources, GX500 is using as follows except dedicated to SIM and Memory. GX500 GPIO(General Purpose Input/Output) Map, describing application, I/O state, and enable level, is shown in below table.

**Table 3-10 S-GOLDradio GPIO pin Map**

| Port function | Signal Name | Reset Value | Description |
|---|---|---|---|
| #Keypad | | | |
| KP_IN0 | | T/PU | Not Used |
| KP_IN1 | | T/PU | Not Used |
| KP_IN2 | | T/PU | Not Used |
| KP_IN3 | | T/PU | Not Used |
| KP_IN4 | | T/PU | Not Used |
| KP_IN5 | | T/PU | Not Used |
| KP_IN6 | | T/PU | Not Used |
| KP_OUT0 | | T/PU | Not Used |
| KP_OUT1 | | T/PU | Deleted |
| KP_OUT2 | | T/PU | Not Used |
| KP_OUT3 | | T/PU | Not Used |
| #USART0 | | | |
| USART0_RXD | SIM2_UART_RX | T/PD | |
| USART0_TXD | SIM2_UART_TX | T/PU | |
| USART0_RTS_N | | T/PU | Not Used |
| USART0_CTS_N | | T/PU | Not Used |
| DSPOUT0 | | T/PU | Not Used |
| #USB | | | |
| USB_DPLUS | SIM2_USB_DP | T | |
| USB_DMINUS | SIM2_USB_DM | T | |
| #CIF:Camera Interface | | | |
| CIF_D0 | | T/PD | Not Used |
| CIF_D1 | | T/PD | Not Used |
| CIF_D2 | | T/PD | Not Used |
| CIF_D3 | | T/PD | Not Used |
| CIF_D4 | | T/PD | Not Used |
| CIF_D5 | | T/PD | Not Used |
| CIF_D6 | | T/PD | Not Used |
| CIF_D7 | | T/PD | Not Used |
| CIF_PCLK | | T/PD | Not Used |
| CIF_HSYNC | | T/PD | Not Used |
| CIF_VSYNC | | T/PD | Not Used |
| CLKOUT2 | | T/PD | Not Used |
| CIF_PD_GPIO | | T/PD | Not Used |

| | | | |
|---|---|---|---|
| CIF_RESET_GPIO | | T/PD | Not Used |
| #Display_Interface | | | |
| DIF_D0 | | T/PD | Not Used |
| DIF_D1 | | T/PD | Not Used |
| DIF_D2 | | T/PD | Not Used |
| DIF_D3 | | T/PD | Not Used |
| DIF_D4 | | T/PD | Not Used |
| DIF_D5 | | T/PD | Not Used |
| DIF_D6 | | T/PD | Not Used |
| DIF_D7 | | T/PD | Not Used |
| DIF_CS1 | | T/PU | Not Used |
| DIF_CS2 | | T/PU | Not Used |
| DIF_CD | | T/PU | Not Used |
| GPIO_41 | SIM2_RPWRON | T/PU | |
| DIF_RD | | T/PU | Not Used |
| GPIO_43 | SGR_INT | T/PD | |
| DIF_VD | | T/PD | Not Used |
| EINT3 | SG3_INT | T/PD | |
| #I2C | | | |
| I2C_SCL | S2_I2C_SCL | T | |
| I2C_SDA | S2_I2C_SDA | T | |
| PM_INT | NONE | # | |
| #Chip Card (USIM1) | | | |
| CC_IO | SGR_SIM2_IO | OD/L | |
| CC_CLK | SGR_SIM2_CLK | L | |
| CC_RST | SGR_SIM2_RST | L | |
| #MMCI: Multimedia Card IF | | | |
| MMCI_CMD | | T/PD | Not Used |
| MMCI_DAT0 | | T/PD | Not Used |
| MMCI_CLK | | T/PD | Not Used |
| #USIF: Universal Serial IF | | | |
| USIF_TXD_MTSR | | T/PD | Not Used |
| USIF_RXD_MRST | | T/PD | Not Used |
| USIF_SCLK | | T/PD | Not Used |
| #I2S1: DAI-PCM | | | |
| I2S1_CLK0 | SIM2_I2S1_CLK | T/PD | |
| I2S1_RX | SIM2_I2S1_RX | T/PD | |
| I2S1_TX | SIM2_I2S1_TX | T/PD | |
| I2S1_WA0 | SIM2_I2S1_WA0 | T/PD | |
| #MMCI: SD-Extension | | | |
| MMCI_DAT1 | _DPRAM_INT_S2 | T/PD | Power Change |
| MMCI_DAT2 | _DPRAM_BUSY_S2 | T/PD | |
| MMCI_DAT3 | _DPRAM_SEM_S2 | T/PD | |

| #Voiceband: Analog Interface | | | |
|---|---|---|---|
| EP_N | SKP_N | | |
| EP_P | SPK_P | | |
| HS_N | RCV_N | | |
| EP_CM | | | Not Used |
| HS_P | RCV_P | | |
| MIC1_N | SIM2_MIC_N | | |
| MIC1_P | SIM2_MIC_P | | |
| MIC2_N | SIM2_HSMIC_N | | |
| MIC2_P | SIM2_HSMIC_P | | |
| VMIC | TP 515 | | Not Used |
| #Measurement | | | |
| M0 | BAT_ID | | |
| M1 | S2_RF_TEMP | | |
| M2 | | | |
| M7 | GND | | |
| M8 | VBAT | | |
| M9 | | | |
| M10 | | | |
| #Bandgap reference: Analog Interface | | | |
| VREF2 | GND | | |
| IREF2 | GND | | |
| #JTAG | | | |
| TDO | S2_TDO | T | |
| TDI | S2_TDI | PU | |
| TMS | S2_TMS | PU | |
| TCK | S2_TCK | PD | |
| TRST_n | S2_TRSTn | PD | |
| RTCK | S2_RTCK | L | |
| #Debug | | | |
| TRIG_IN | 0 | PD/Latched | |
| MON1 | 1 | PD/Latched | |
| MON2 | 0 | PD/Latched | |
| #External Bus Interface (EBU) | | | |
| #FCDP: Flash Controller DMA Port | | | |
| FCDP_RBN | S2_FCDP | T/PU | |
| #GSM TDMA Timer: GSM Control | | | |
| T_OUT1 | NONE | T/PD/Latched | |
| T_OUT2 | NONE | T/PD/Latched | |
| T_OUT3 | | T/PD | |
| T_OUT4 | | T/PU | |
| T_OUT5 | | T/PD | |

| | | | |
|---|---|---|---|
| T_OUT6 | PA_MODE_2 | T/PD | |
| T_OUT7 | | T/PD | |
| T_OUT8 | | T/PD | |
| #Other Functional Pins: Clocks and control | | | |
| CLKOUT0 | | T/PD | Not Used |
| F26M | NONE | # | |
| F32K | F32K | # | |
| OSC32K | OSC32K | # | |
| RESET_N | nRESET | | |
| VDD_FUSE_FS | GND | | |
| RTC_OUT | NONE | # | |
| PMU_SCMODE_OUT | NONE | | |
| VCXO_EN | NONE | H | |
| #Extra I/Os & Interrupt Inputs | | | |
| DSPIN0 | | T/PD | Not Used |
| DSPIN1 | | T/PU | Not Used |

## 3.3 Power management IC

GX500 is composed of dual Power Management Part. (S-Gold3 & S-Gold Radio)

### 3.3.1 S-Gold3 Part

#### 3.3.1.1 General Description

SM-POWER is a highly integrated Power and Battery Management IC for mobile handsets. It has been specially designed for usage with S-Gold3. Although optimized for usage with the Infineon S-GOLD baseband device it is suitable for the S-GOLDlite and the E-GOLD+ baseband devices as well. It also supports the cellular RF devices like SMARTi-DC, SMARTi-DC+, SMARTi-SD and the Bluemoon Single, Infineon's single chip solution for Bluetooth. If used with S-GOLD3 it provides all power supply functions (except for the RF PA) for a complete advanced GSM Edge smart phone minimizing external device count.

**Block Description**
• Highly efficient step-down converter for main digital baseband supply including Core, DSP and memory interface (External Bus Unit).
• Support of S-GOLD standby power-down concept
• Low-drop-out (LDO) regulators for Flash and mobile RAM memory devices
• Voltage independent switching of two SIM cards
• LDO regulators for baseband I/O supply
• LDO regulator for analog mixed-signal section of S-GOLD
• Low-noise LDO regulators for RF devices
• Supply for Bluemoon Single, Infineon's single chip solution for Bluetooth
• Audio amplifier 8 Ohms for handsfree operation and ringing
• Charge Control for charging Li-Ion/Polymer batteries under software control
• Pre-charge current generator with selectable current level
• RTC regulator with ultra-low quiescent current
• USB interface support for peripheral and mini-host mode
• Backlight LEDs driver with current selection and PWM dimming function
• Two single LED driver outputs for signaling
• Vibrator driver with adjustable voltage
• Fully controlable by software via I2C – Bus
• Temperature and battery voltage sensors
• Interrupt channels for peripherals
• System debug mode
• VQFN 48 package with heat sink and non-protruding leads
• Compatible with the Infineon E-GOLD+ V2 and V3

SM-POWER is a further step on the successful E-Power product line with enhanced and optimized functionality.

SM-POWER features a baseband supply concept with a DC/DC step-down converter cascaded by two linear regulators

–SM-POWER's DC/DC converter makes up to 40 % reduction of battery current for smart phone functions (e.g. organizer functions, games, MP3 decoding) possible.

– SDBB has high efficiency up to 95% and also a power save mode.
– Memory Interface is directly supported by the SDBB
– SDBB can also act as main supply voltage for E-GOLD+ or S-GOLDlite baseband devices.
– For S-GOLD two linear regulators for DSP and Core are cascaded after the SDBB.

SM-POWER supports the standby power-down concept of S-GOLD by temporarily switching off the linear regulator for the DSP during mobile standby whenever this subsystem is not used. In this phase the ARM controller and most peripherals including parts of the on-chip SRAM are kept powered-up with power being supplied by the other linear regulator.

SM-POWER includes a fully differential audio amplifier able to drive loads down to a nominal value of 8 Ohm for usage in hands-free phones and for ringing

– 450 mW maximum output power

– adjustable gain

– mute switch SM-POWER also integrates a charging function for Li-Ion, Li-Polymer batteries
– click and pop -protection SM-POWER also integrates a charging function for Li-Ion, Li-Polymer batteries
– Precharge current source with two current levels
– Constant current / constant voltage charging with 3 different termination voltages
– Programable charge current limitation for use with different batteries
– Freely programable pulse charging to reduce the thermal power dissipation in the constant voltage charging phase
– Top-off charge current sensing SM-POWER completes the USB interface of S-GOLD
– Regulated voltage for S-GOLD USB interface including reverse current and overvoltage protection
– Switch to supply USB pull-up resistor
– Mini-host pull down resistor functionality
– Charge pump with internal switching capacitor for USB host VBUS supply voltage SM-POWER fully supports LED and Vibra Motor functionality
– no external components needed
– driver for backlight LEDs adjustable in steps up to 140mA and with soft turn on and off by PWM dimming
– two driver outputs for single LEDs for precharge indication and signaling with i.e. change of colour

–driver for Vibra Motor with adjustable voltages, soft startup / shutdown and current limitation
SM-POWER offers several control functions
– Power-on Reset Generator with logic state machine
– I2C bus interface

– I2C bus configurable mode control logic with ON (push-button or RTC), VCXOEN and LRF3EN (wake-up by Bluetooth) inputs
– Programable interrupt channels to handle peripherals like SIM, MMC and USB
– Monitoring of charging functions
– Undervoltage Shut-Down
– Errorflags (volatile or non-volatile) from many power-supply functions and thermal sensor in order to debug system
– Overtemperature Shut-Down
– Overtemperature Warning
– Support of S-GOLD standby power-down concept
– Support of S-GOLD Power-Down Pad Tristate Function

# 3. TECHNICAL BRIEF

**Table 3-11. LDO Output Table of SM-Power**

| LDO | Net name | Output Voltage | Output Current | Usage |
|---|---|---|---|---|
| SD1 | 1V35_Core | 1.35V | 600mA | Core & for LDO |
| SD2 | 1V8_SD | 1.8V | 300mA | Memory |
| VAUX | 2V85_VFM | 2.9V | 100mA | LCD |
| VIO | 2V62_VIO | 2.62V | 100mA | Peripherals |
| VSIM | 2V9_SIM | 2.9V | 70mA | SIM card |
| VMME | 2V8_VMME | 2.9V | 150mA | u-SD |
| VUMTS | 1V5_VBT | 2.85V | 110mA | Not used |
| VUSB | VUSB | 3.1V | 40mA | Not used |
| VLED | VLED | 2.9V | 10mA | Not used |
| VAUDIOa | 2V5_VAUDA | 2.5V | 200mA | Stereo headset, Mono earpiece |
| VAUDIOb | 2V5_VAUDB | 2.5V | 50mA | Analog parts of S-Gold |
| VRF1 | 2V85_VRF | 2.85V | 150mA | 2.85 V supply for SMARTi-PM RF transceiver |
| VRF2 | 1V5_VRF | 1,53V | 100mA | 1.5 V supply for SMARTi-PM RF transceiver |
| VRF3 | 2V65_VBT | 2.7V | 150mA | Bluetooth |
| VPLL | 1V35_VPLL | 1.35V | 30mA | S-GOLD3 PLL |
| VRTC | 2V11_RTC | 2.11V | 4mA | Real Time Clock |
| VAFC | VAFC | 2.65V | 5mA | Not used |
| VVIB | 2V8_VVIB | 2.8V | 140mA | Vibrator |

**Figure 3-4. SM-Power Circuit Diagram of GX500**



**Figure 3-5 SM-Power Circuit Diagram with charging part**

## 3.3.2 S-Gold Radio Part

### 3.3.2.1 General Description

S-GOLDradio integrates a Power Management Unit for Lithium-Ion battery driven applications that require different power rails. The S-GOLDradio PMU provides two fully integrated, highly efficient, step-down converters for the main loads such as cores and memories. Both step-down converters support low power modes (PFM) for maximum efficiency at all times, the output voltages are stable under all load conditions. For supply voltages higher than the battery voltage, the S-GOLDradio PMU provides a step-up converter. This step-up converter provides the supply voltage to, for example, serial connected LED's used in display backlight. A number of LDOs are available to provide different supply rails for different needs.
In addition, the S-GOLDradio PMU supports charging of the battery and generates the power-on reset. It also provides stand-by voltages and supports different low power modes. See Figure 4.
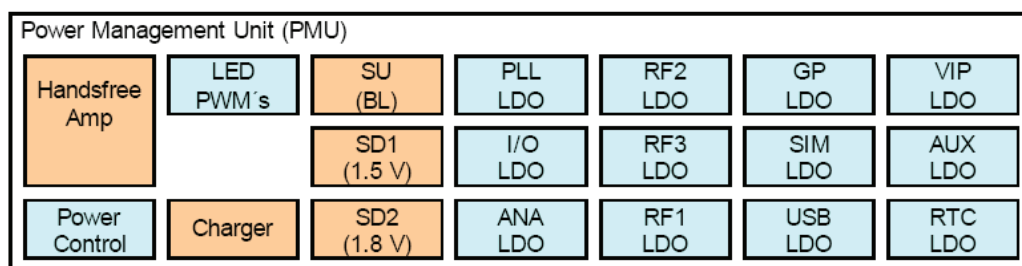


S-GOLDradio_PMU.vsd

**Figure 3-6 S-GOLDradioTM PMU Block Diagram**

**General Features**

• Software controlled charging of Lithium-Ion batteries

• Different low power modes for very low power consumption

• Temperature monitoring with built-in over-temperature warning.

**Switched Power Supplies**

• Two fully integrated step-down converters with PFM low power modes:

– 400 mA high efficiency step-down converter (SD1) with 1.5 V output voltage

– 300 mA high efficiency step-down converter (SD2) with 1.8 V output voltage

• One step-up converter:

– 5.6 V ... 25 V, 120 mA step-up converter (SU1) for the main LCD backlight, keypad backlight and photo

   flash.

**Linear Low Dropout (LDO) Regulators**

• General Purpose LDOs:

– 2.9 V, 150 mA, ultra low drop (**VAUX**)

– 2.62 V, 100 mA (**VIO**)

– 1.8 V / 2.9 V, 22 mA, ultra low drop (**VSIM**)

– 1.8 V / 2.9 V, 150 mA, ultra low drop (**VMME**)

– 2.8 V, 140 mA, ultra low drop (**VVIB**)

– 3.1 V, 40 mA, ultra low drop (**VUSB**)

• Low Noise LDOs:

– 2.5V**,** 220 mA (**VAUDIOa**)

– 2.85 V, 20 mA (**VRF1**)

– 1.5 V, 80 mA (**VRF2**)

– 2.85 V, 150 mA (**VRF3**)

**Low Power LDOs**

• 1.5 V, 20 mA (**VPLL**)

• 2.0 V, 4 mA (**VRTC**).

**LED Control**

• 3x PWM modulated control signal

• Current Sink Support for photo flash LED driver

• Support for serial connected LEDs

• Support for Trickle and Indicator LED.

**Audio Amplifier**

• Battery driven 400 mW differential audio amplifier for driving 8 ohm loudspeaker

• Three gain stages including overdrive for ringing tones

• >90 dB PSRR (4 kHz).

# 3. TECHNICAL BRIEF

**Interfaces**

• I2C control interface for device configuration

• PMU is configured in software via registers

• Power-on reset generation

• Interrupt (event) line to indicate status change.

**Control Unit**

• Device ON/OFF switching

• Over-temperature warning

• System start-up state machine

• Under-voltage shut down with defined system behavior

• Independent LDO switch on

• Software and hardware programmable voltages

• System watchdog timer with on-chip oscillator.



**Figure 3-7 S-GOLDradio PMU circuit diagram**

### 3.3.3 Charging

SM-POWER provides together with an external p-channel FET Siliconix Si3455 an external AC-adapter a complete charge control function for charging of Li-Ion or Li-Ion-Polymer batteries. Either a 1-cell Li-Ion or Li-Ion-Polymer battery with 4.1, 4.2 or 4.4 Volts may be used.

| 4.2V~3.75V | 3.75V~3.65V | 3.65V~3.58V | 3.58V~3.30V |

**Figure 3-8 Battery Block Indication**

1. Charging method : CC-CV
2. Charger detect voltage : 4.0 V
3. Charging time : 3h 15m
4. Charging current   :   680 mA
5. CV voltage : 4.2 V
6. Cutoff current   : 120 mA
7. Full charge indication current (icon stop current) : 120 mA
8. Recharge voltage : 4.16 V
9. Low battery alarm
   a. Idle : 3.58 V ~ 3.3 V
   b. Dedicated : 3.58 V ~ 3.3 V
10. Low battery alarm interval
    a. Idle : 3 min
    b. Dedicated : 1 min
11. Switch-off voltage : 3.3 V
12. Charging temperature adc range
    a. ~ -5℃ : low charging voltage operation (3.6 V ~ 3.9 V) .
    b. -5℃  ~ 50℃  : standard charging (up to 4.2 V)
    C. 50℃~ : low charging voltage operation (3.6V ~ 3.9V)

# 3. TECHNICAL BRIEF

## 3.4 Power ON/OFF

GX500 Power State : Defined 3cases as follow
▶ Power-ON : Power key detect (SM-Power's ON port)
▶ Power-ON-charging : Charger detect.

**S/M-POWER**

**S-GOLD**

VBAT

C1

VDDA

$V_{IH} \geq 1.2V$
Turn-on requested
i.e. by RTCOUT

$V_{IH} \geq V_{BAT} - 0.3V$
Turn-on requested
and pushbutton
activated

$V_{BAT} = 2.1V...5.2V$

RTCOUT

$V_{oh} = 1.2V...2.11V$

ON

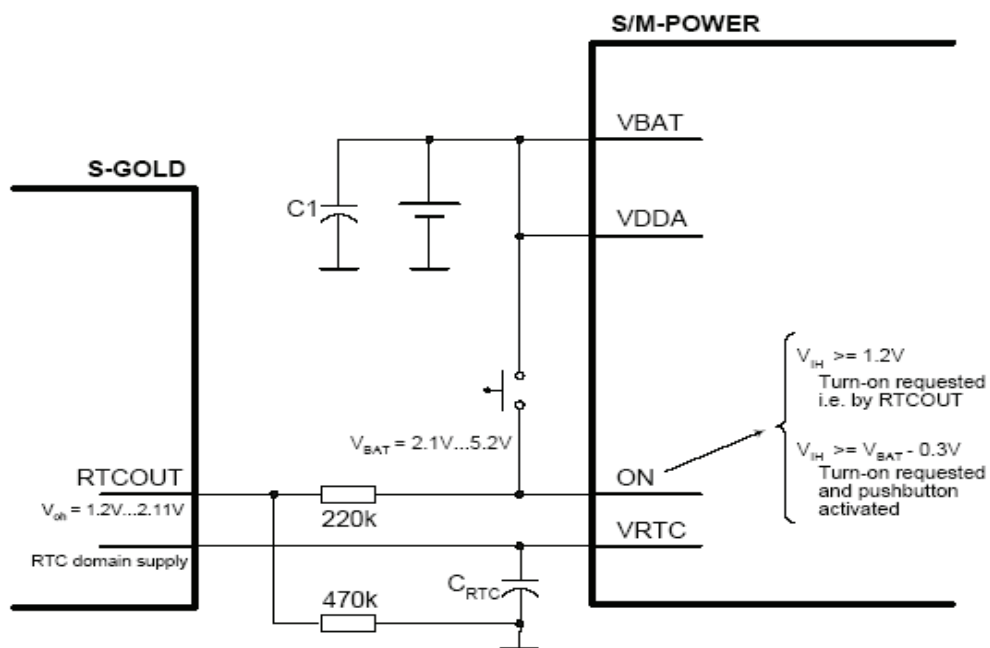220k

VRTC

RTC domain supply

470k

$C_{RTC}$

**Figure 3-9 Power on application.**

Input ON is a power-on input for SM-POWER with 2 active high levels (see Figure 6). It might be triggered by a push button or by the RTCOUT output of the S-GOLD device as well. To detect if the push-button is pressed during system operation the logical level at pin ON or its change (if Bit 1 EION in INTCTRL2 is asserted) is recorded in bit LON of the ISF register. If the high level of voltage at pin ON does not reach VIHdet (Vbat-0.8 ~ Vbat-0.3) the above-mentioned bit won't be set.

To support Remote power on function for factory mass production, applied an analog switch as following figure. As monitoring the RPWRON and Key matrix KP_OUT(2) & KP_IN (0), GX500 system recognize whether remote power on or End-key pushed
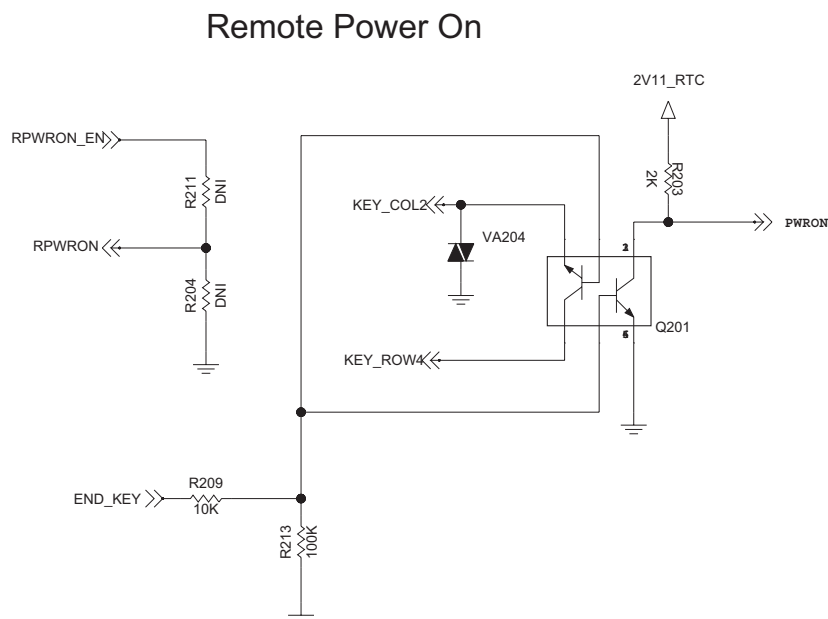
## Remote Power On



**Figure 3-10 Remote power on and End-key power on circuit**

# 3. TECHNICAL BRIEF

## 3.5 Dual SIM & u-SD Interface

### 3.5.1 Dual SIM Interface

GX500 supports dual SIM mode and each SIM supports 1.8V & 2.9V plug in SIM, SIM interface scheme is shown in (Figure 8).
SIM_IO, SIM_CLK, SIM_RST ports are used to communicate with BBP(S-Gold3) and the SIM power supply enabled by PMIC.

**SIM Interface**
SIM_CLK : SIM card reference clock
SIM_RST : SIM card Async /sync reset
SIM_IO : SIM card bidirectional reset



**Figure 3-11 Dual SIM Interface**

## 3.5.2 u-SD Card Interface

The MicroSD Memory Module has eight exposed contacts on one side. The S-Gold3 is connected to the module using a dedicated eight-pin connector
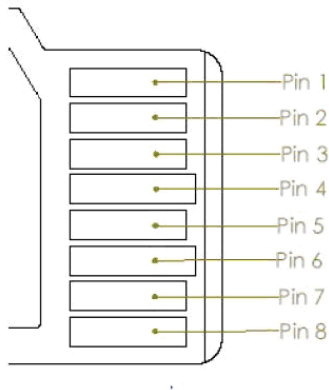


**Figure 3-12 Micro SD Memory Card Detection Scheme**

**Table 3-12 Micro SD memory pad assign.**

| SD mode | | | |
|---|---|---|---|
| **Pin No.** | **Name** | **Type** | **Description** |
| 1 | DAT2 | I/O | Data bit [2] |
| 2 | CD/DAT3 | I/O | Data bit [3] |
| 3 | CMD | I/O | Command response |
| 4 | VDD | Power | Power supply |
| 5 | CLK | I | Clock |
| 6 | VSS | Ground | Power ground |
| 7 | DAT0 | I/O | Data bit [0] |
| 8 | DAT1 | I/O | Data bit [1] |

## 3.6 Memory

GX500 is composed of 3 memories. 2 MCPs(NAND+SDR) are connected each BBP(SG3 / SGR).
And 1 DPRAM is used to communicate between 2 MCPs.(SG3 and SGR).

2G NAND(LB/128Mx16bit) +1G SDR SDRAM(8Mx4x32bit)
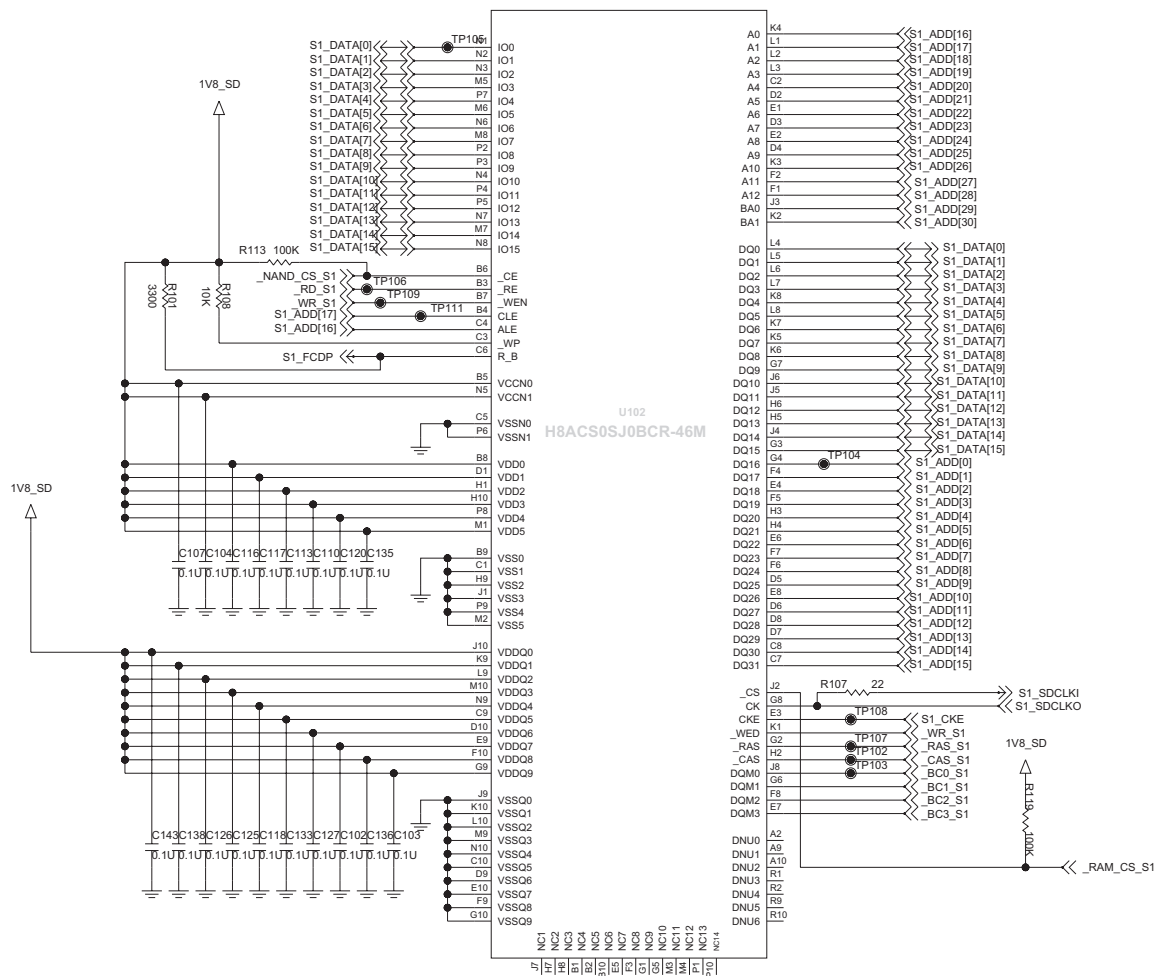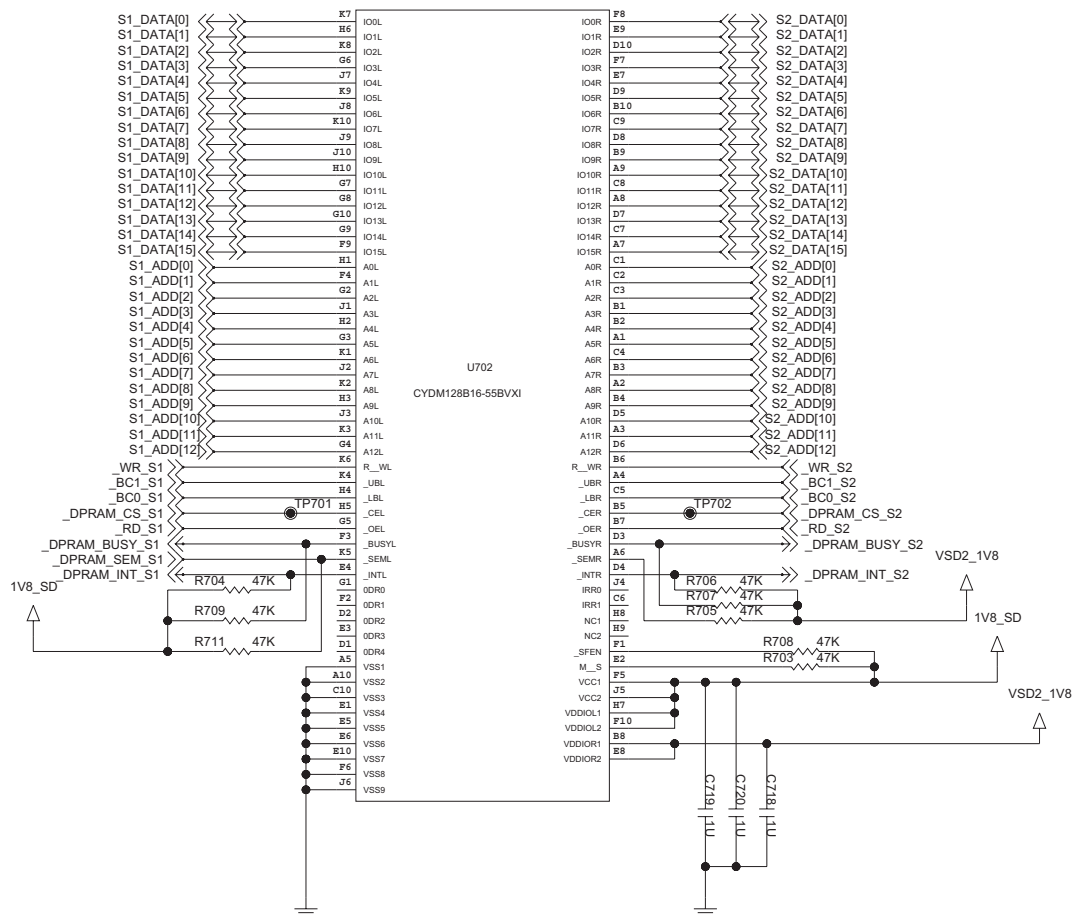EUSY0347505, Hynix



**Figure 3-13 SGold3 Part Flash memory & SDR RAM MCP circuit diagram**

1G NAND(LB/64Mx16bit) +512M SDR SDRAM(8Mx4x16bit)
EUSY0389001, SS



**Figure 3-14 SGold Radio Part Flash memory & SDR RAM MCP circuit diagram**

128K DUAL PORT STATIC RAM
EUSY0285602, CYPRESS

**Figure 3-15 DPRAM for communication Between SGold3 and SGold Radio**

## 3.7 LCD Display

LCD module include:
- Main LCD: 3.0" 240x400 WQVGA, 262K color TFT
- Backlight : 6 piece of white LED

**LCD FPC Interface Spec:**

**Table 3-13. LCD FPC Interface Spec.**

| Pin No | Symbol | Description | I/O | Remarks |
|---|---|---|---|---|
| 1 | GND | GND level pin | - | |
| 2 | VDDIO | Power supply for I/O | - | |
| 3 | VCC | Power supply for analog | - | |
| 4 | D0 | Data Bus | I/O | |
| 5 | D1 | Data Bus | I/O | |
| 6 | D2 | Data Bus | I/O | |
| 7 | D3 | Data Bus | I/O | |
| 8 | D4 | Data Bus | I/O | |
| 9 | D5 | Data Bus | I/O | |
| 10 | D6 | Data Bus | I/O | |
| 11 | D7 | Data Bus | I/O | |
| 12 | D8 | Data Bus | I/O | |
| 13 | D9 | Data Bus | I/O | |
| 14 | D10 | Data Bus | I/O | |
| 15 | D11 | Data Bus | I/O | |
| 16 | D12 | Data Bus | I/O | |
| 17 | D13 | Data Bus | I/O | |
| 18 | D14 | Data Bus | I/O | |
| 19 | D15 | Data Bus | I/O | |
| 20 | GND | GND level pin | - | |
| 21 | GND | GND level pin | - | |
| 22 | IF_MODE 0 | CPU Interface bus width select | I | * Note 1 |
| 23 | OPEN (OTP) | (OTP Program Pin) | I | Don't Care (open) |
| 24 | VSYNC_O | Tearing Effect Output | O | |
| 25 | WRB | Write enable | I | Low(GND) enable |
| 26 | RDB | Read enable | I | Low(GND) enable |
| 27 | RESETB | Reset enable | I | Low(GND) enable |
| 28 | CSB | Chip Select | I | Low(GND) enable |
| 29 | RS | Data / Command selectable | I | High(VDDIO) : Access to data  Low(GND) : Access to Index |
| 30 | IF_MODE | CPU Interface bus width select | I | * Note 1 |
| 31 | LED6 | LED6 Cathode | - | |
| 32 | LED5 | LED5 Cathode | - | |
| 33 | LED4 | LED4 Cathode | - | |
| 34 | LED3 | LED3 Cathode | - | |
| 35 | LED2 | LED2 Cathode | - | |
| 36 | LED1 | LED1 Cathode | - | |
| 37 | LEDA | LED1~6 Anode Common | - | |
| 38 | MAKER_ID (L) | Maker ID pin | - | Connected to "GND" on FPC |
| 39 | LED_PWM | PWM signal for backlight control | O | |
| 40 | GND | GND level pin | - | |

## 3.8 Keypad Switching & Scanning

The keypad interface is a peripheral which can be used for scanning keypads up to 3 rows (outputs from Port Control Logic) and 2columns (inputs to PCL). The number of rows and columns depend on settings of the PCL.
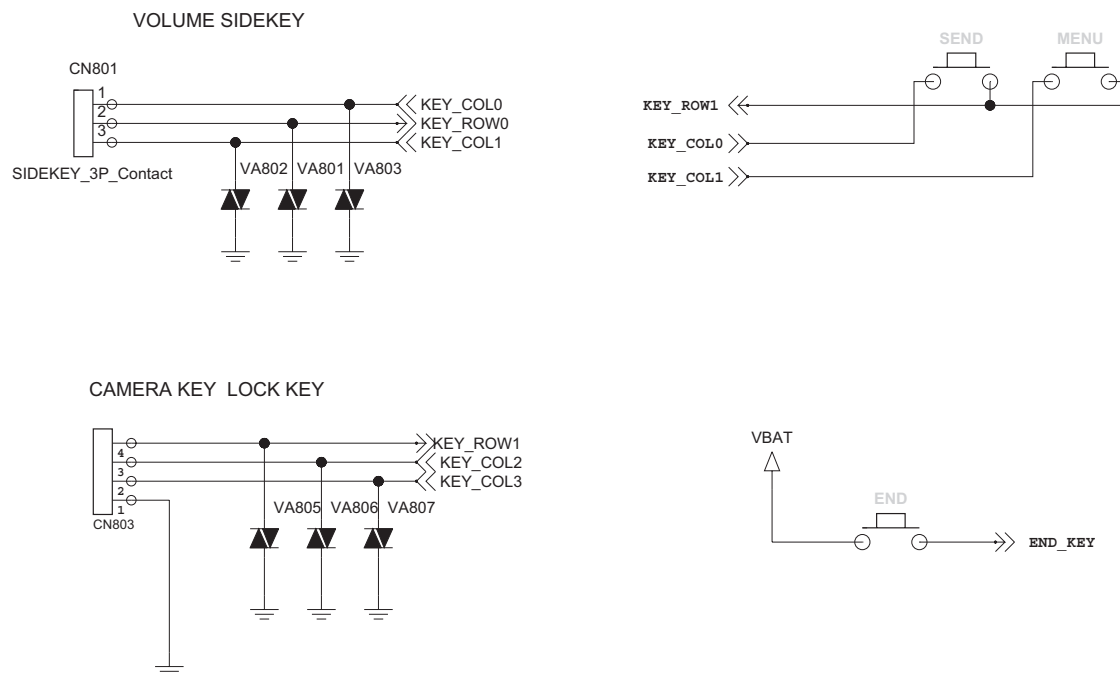


**Figure 3-16 Key pad part key matrix**

## 3.9 LCD back-light illumination

The SC654 is a high efficiency charge pump LED driver using Analogic-tech's proprietary charge pump technology. Performance is optimized for use in single-cell Li-ion battery applications.

### LCD BACKLIGHT  LED DRIVER

**Figure 3-17 LCD Back light unit and Flash LED charge pump IC**

The LED current magnitude is controlled by the EN/SET pin using the S2Cwire interface. The interface records rising edges of the EN/SET pin and decodes them into 32 individual current level settings. Code 1 is full scale (31mA), and Code 32 is 0.5mA. The modulo 32 interface wraps states back to state 1 after the 32nd clock. The counter can be clocked at speeds up to 1MHz, so intermediate states are not visible. The first rising edge of EN/SET enables the IC and initially sets the output LED current to full scale, the lowest setting equal to 0.5mA. Once the final clock cycle is input for the desired brightness level, the EN/SET pin should be held high to maintain the device output current at the programmed level.
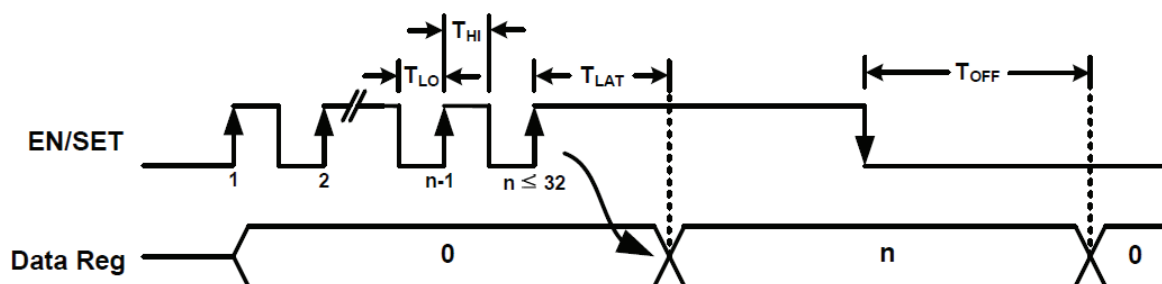
**Figure 3-18 control method**

# 3. TECHNICAL BRIEF

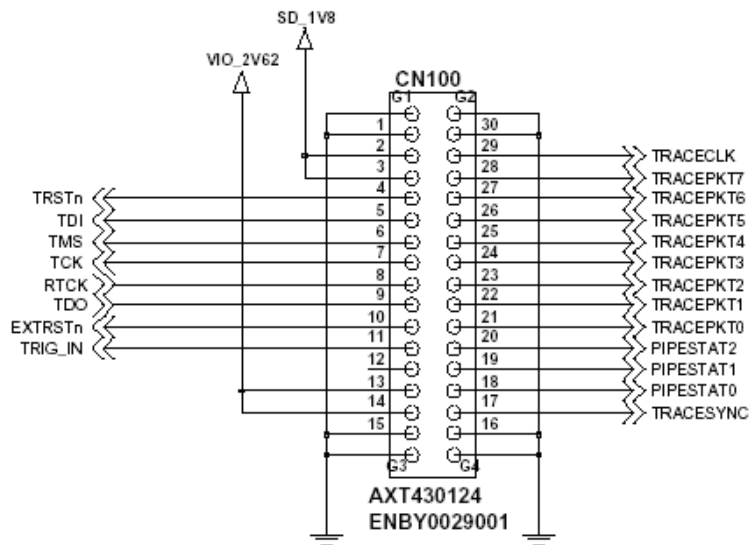## 3.10 JTAG & ETM interface connector



**Figure 3-19 JTAG & ETM(Embedded Trace Module) interface connector**

In case of GX500 mass production, the JTAG & ETM interface connector will not be mount on board. That is only for developing and software debugging purpose.( It will not be mounted on mass production PCB)

## 3.11 Audio
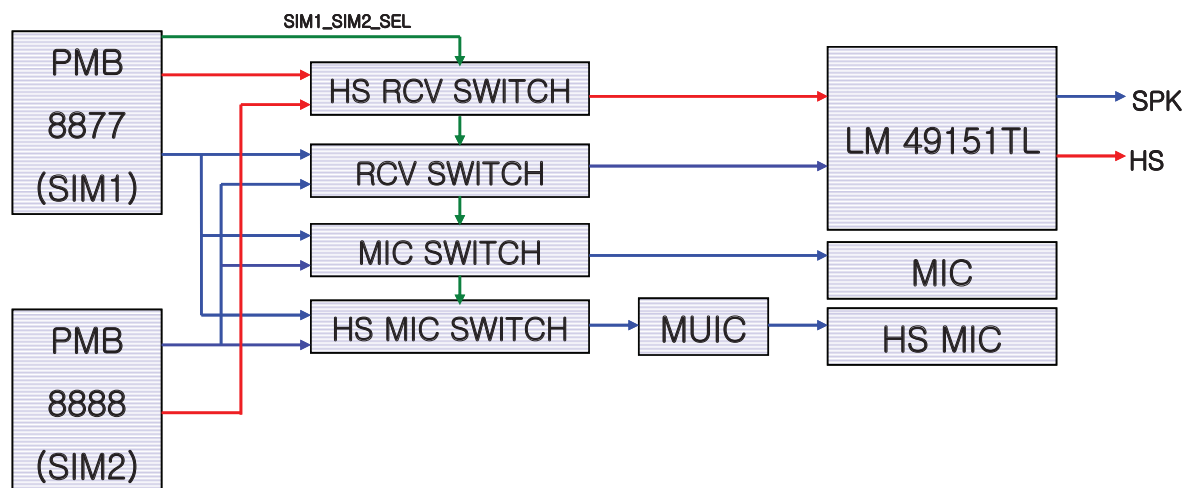
GX500 Audio signal flow diagram as following diagram.



**Figure 3-20 Audio signal flow diagram**

## 3.11.1 Audio amplifier

The LM49151 is a fully integrated audio subsystem designed for portable handheld applications such as cellular phones.

The LM49151 combines a 1.25W mono E2S class D amplifier, 125mW Class AB earpiece driver, 42mW/channel stereo ground referenced headphone drivers, volume control, input mixer/multiplexer, and speaker protection into a single device..
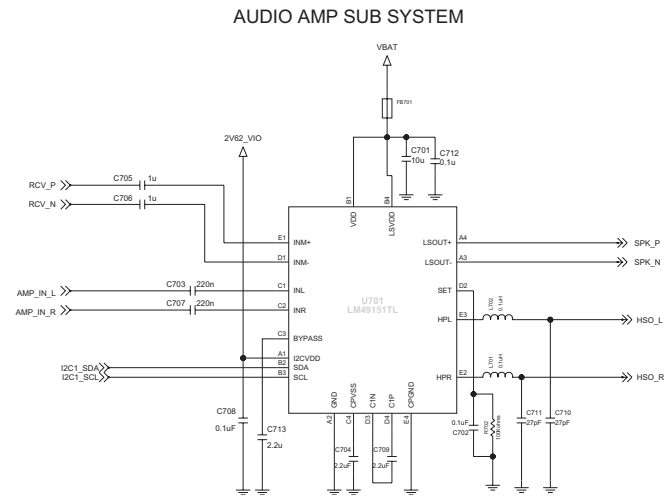


**Figure 3-21 Audio amplifier**
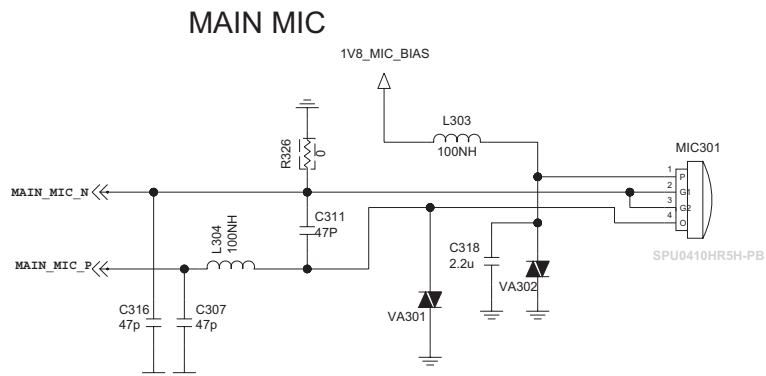
## 3.11.2. Microphone circuit



**Figure 3-22 Microphone circuit**

## 3.12 Charging circuit

The bq25040 has a single power output that charges the battery. A system load can be placed in parallel with the battery. The charge current is programmed using the ISET and EN/SET inputs. The input current limit is programmable to USB100, USB500 or a user programmed current limit up to 1.1A. Additionally, a 4.9V ±3% 50mA LDO is integrated into the IC for supplying low power external circuitry. The single-input interface (EN/SET) is used to select the charge current and to place the bq25040 into Production Test Mode. In Production Test Mode, the bq25040 operates as a linear regulator without a battery connected, where the output is regulated at 4.2V and supplies up to 2.3A to calibrate GSM transceivers.
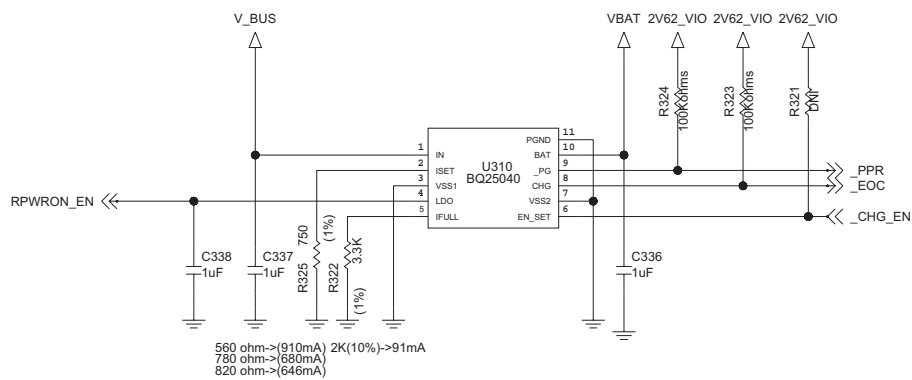


**Figure 3-23 Charging circuit**

# 3. TECHNICAL BRIEF

## 3.13 WI-FI & BLUETOOTH & FM radio

### General Description

The GX500 device provides the highest level of integration for a mobile wireless system, with integrated IEEE802. 11 b/g(MAC/baseband/radio), Bluetooth 2.0, and FM reveiver. The WYSDNBGX6 that is included of BCM4325 solution is supported three kinds of functions. It is the one antenna structure which is supported of WLAN/Bluetooth in 2.4GHzand
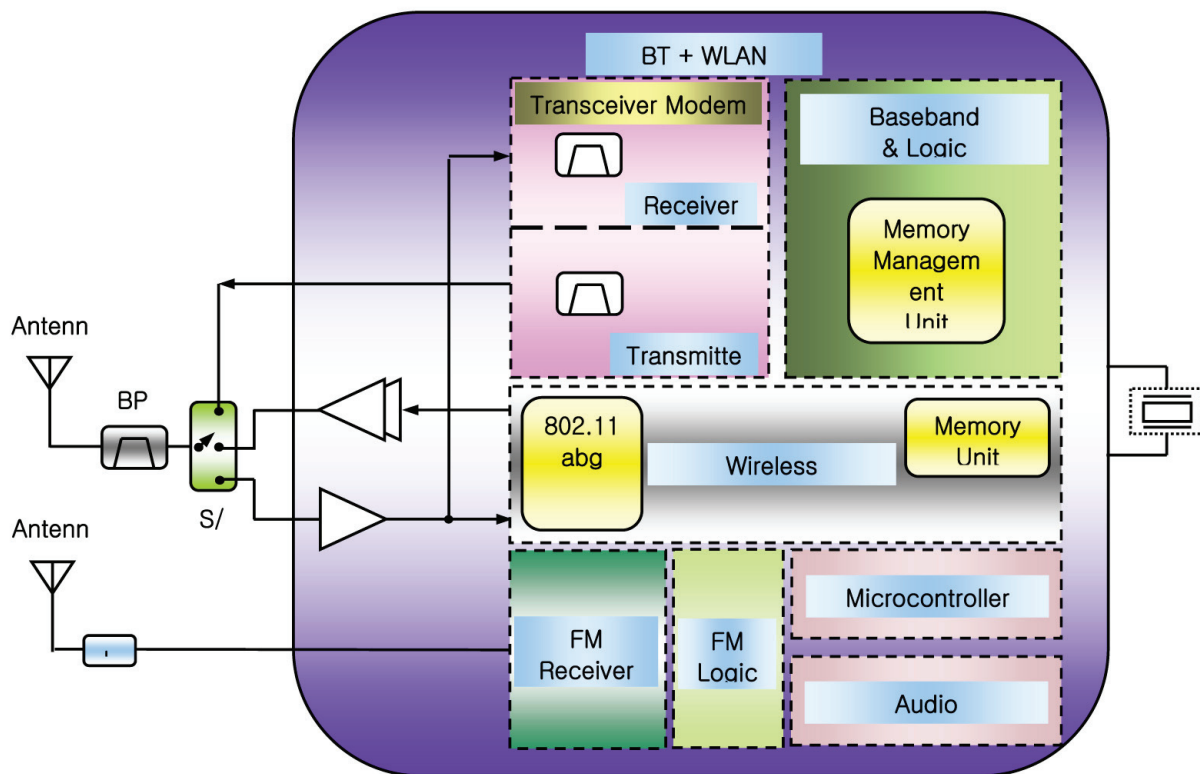


**Figure 3-24 WLAN/Bluetooth FM Radio System Architecture**

### 3.13.1 WLAN

The GX500 supports single-band 2.4GHz IEEE802.11b/g standardization. The WLAN module which is consisted of the BCM4325 single chip device provides for the highest level of integration for a mobile or handheld wireless system, with integrated IEEE802.11TM b/g (MAC/baseband/radio). The BCM4325's integrated CMOS WLAN 2.4GHz power amplifier provide sufficient output power to meet the need of most WLAN devices. The interface between PMB8877 and WLAN module is the standard interfaces SDIO v1.2 (4-bit and 1-bit).

### 3.13.2 Bluetooth

The GX500 provides the Bluetooth 2.0 specification. The Bluetooth module is the optimal solution for any voice or data application that requires the Bluetooth SIG standard Host Controller Interface (HCI) using a high-speed UART and PCM. The Bluetooth solution has an integrated radio transceiver that has been optimized for 2.4GHz Bluetooth wireless systems. It has been designed to provided low power,low-cost, robust communications for applications operating in the globally available 2.4GHz unlicensed ISM band. It is fully compliant with the Bluetooth Radio Specification and meets or exceeds the requirements to provide the highest communication link quality of service

### 3.13.3 FM Radio

This FM is a function of WYSDNBGX6 module, electronically tuned, FM stereo radio with RDS/RBDS demodulator and decoder for low voltage applications, with fully integrated IF selectivity and demodulation. This equipment supports the European Radio Data System (RDS) and the North American Radio Broadcast Data System (RBDS) modulations. The FM unit supports I2C for communications, stereo analog output, as well as I2S and PCM interfaces.

**WLAN+BT+FM**

**LDO for TCXO**

**26MHz TCXO**

**Figure 3-25. WI-FI / Bluetooth / FM Radio Circuit Diagram**

### 3.14 5pin Micro USB Interface connector

**Table 3-14. Multi media interface pin assign**

| | GX500 MMI | |
|---|---|---|
| | **Pin Function** | **Description** |
| 1 | V_BUS | USB V_BUS |
| 2 | USB_DM | USB_DM |
| 3 | USB_DP | USB_DP |
| 4 | ID | Detect ID PIN |
| 5 | GND | GND |

## 5PIN uUSB



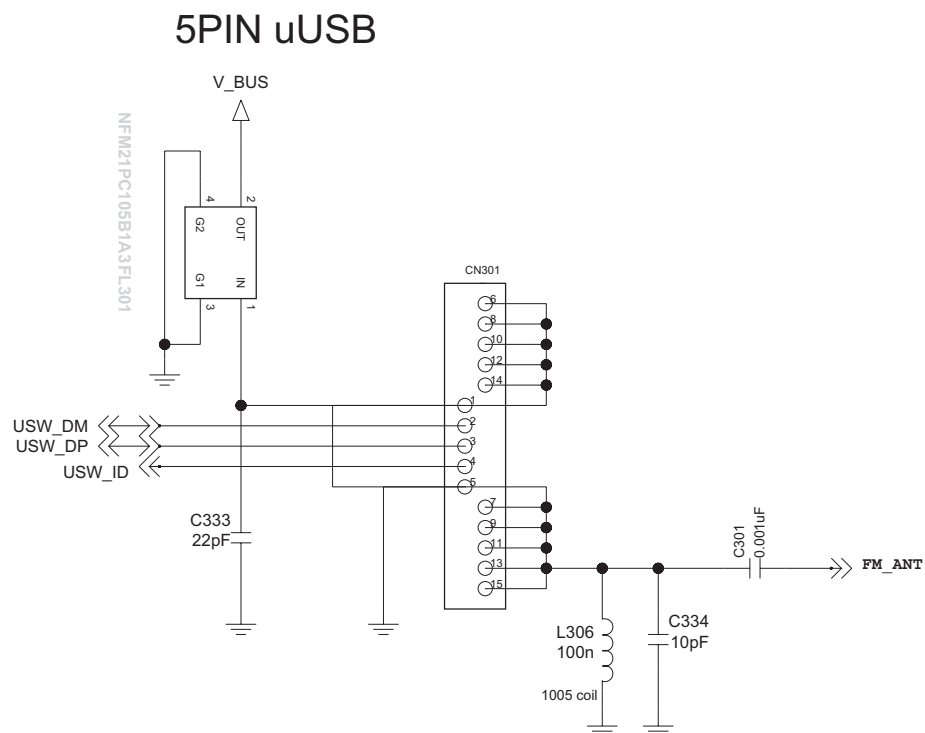**Figure 3-26    5Pin u-USB Connector circuit**

## 3.15 Triaxial, digital acceleration sensor

**General description**

The BMA020 is a tri-axial, low-g acceleration sensor IC with digital output for consumer market applications. It allows measurements of acceleration in perpendicular axes as well as absolute temperature measurement. An evaluation circuitry converts the output of a three-channel micromechanical acceleration sensing structure that works according to the differential capacitance principle.
Package and interface have been defined to match a multitude of hardware requirements. Since the sensor IC has small footprint and flat package it is attractive for mobile applications. The sensor IC can be programmed to optimize functionality, performance and power consumption in customer specific applications.
The BMA150 senses tilt, motion and shock vibration in cell phones, handhelds, computer peripherals, man-machine interfaces, virtual reality features and game controllers.
The BMA150 is the LGA package version of the SMB380 triaxial acceleration sensor which is available in a 3mm x 3mm x 0.9mm QFN package.
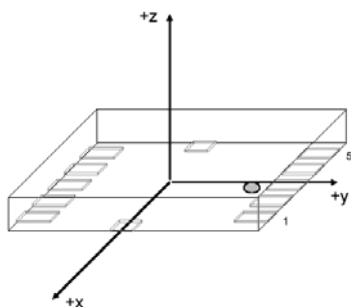
**Axes orientation of the BMA150**
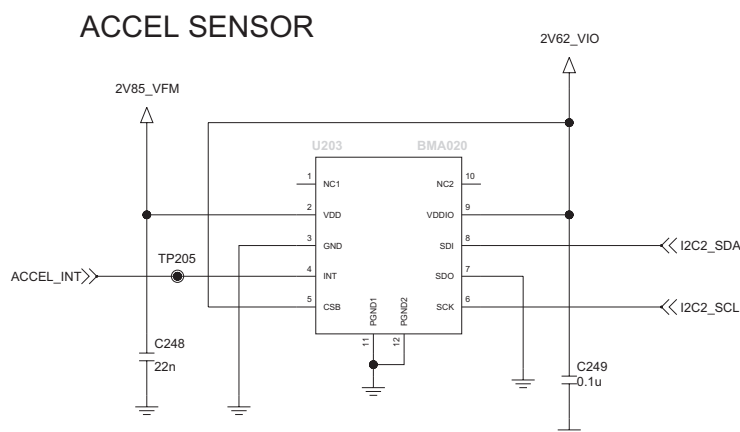
**Figure 3-27 Axes orientation of the BMA150**

**Figure 3- 28 Accel sensor circuit**

## *RF Block Diagram
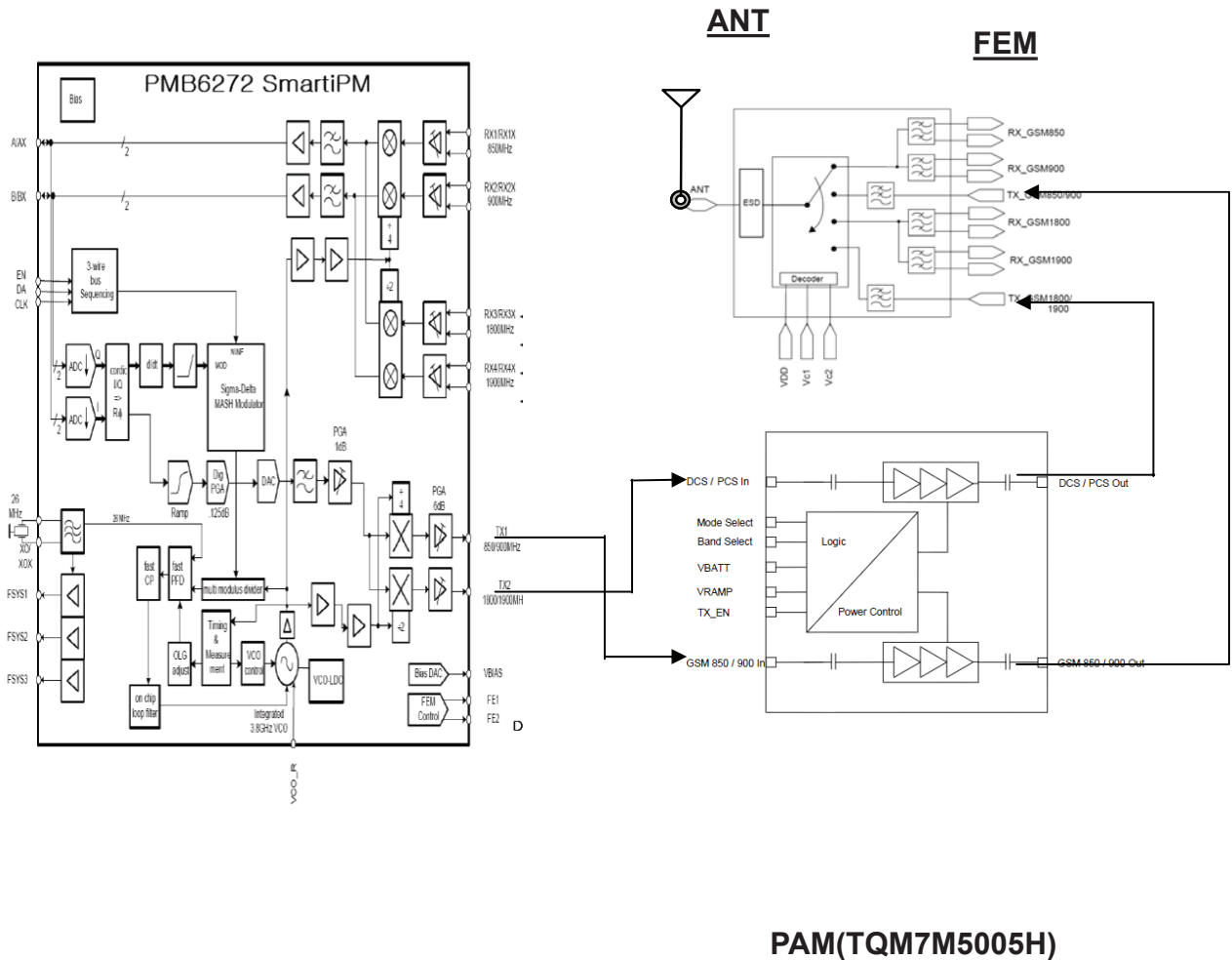


Figure 3-29 GX500 RF part Block Diagram

## 3.16 General Description

The RF transceiver (PMB 6272 SMARTi-PM) is an integrated single chip, quad-band transceiver for GSM850/GSM900/GSM1800/GSM1900 designed for voice and data transfer applications. The transceiver provides an analog I/Q baseband interface and consists of a direct conversion receiver and a quad-band polar transmitter for GSM and EDGE with integrated PGA functionality. Further on a completely integrated SD-synthesizer with HSCSD and GPRS/EDGE capability, a digitally controlled reference oscillator with three outputs, a fully integrated quad-band RF oscillator and a three wire bus interface with all necessary control circuits complete the transceiver.



**Figure 3-30 RF transceiver PMB6272 SMARTi-PM functional block diagram**

**Figure 3-31 RF PAM TQM7M5005H schematic**

# 3. TECHNICAL BRIEF

## 3.17 Receiver part
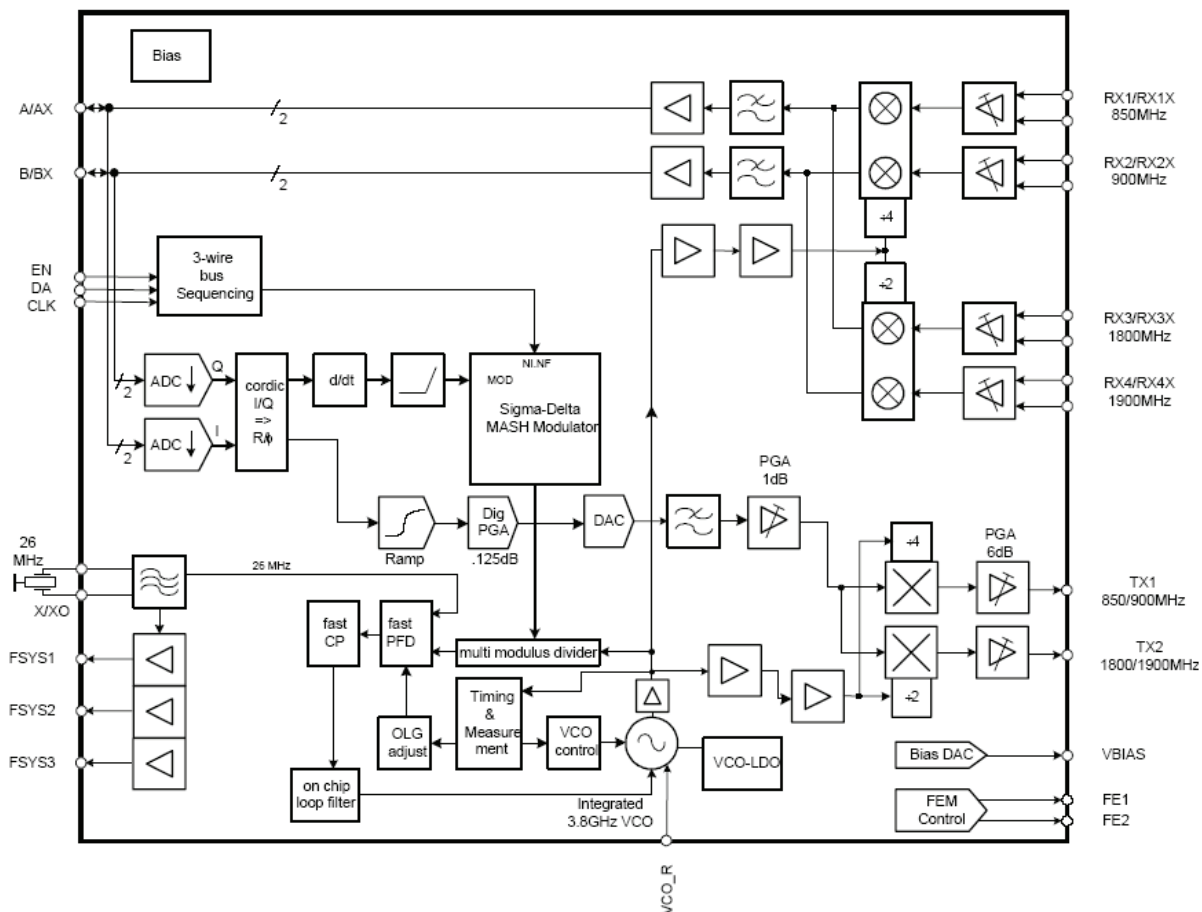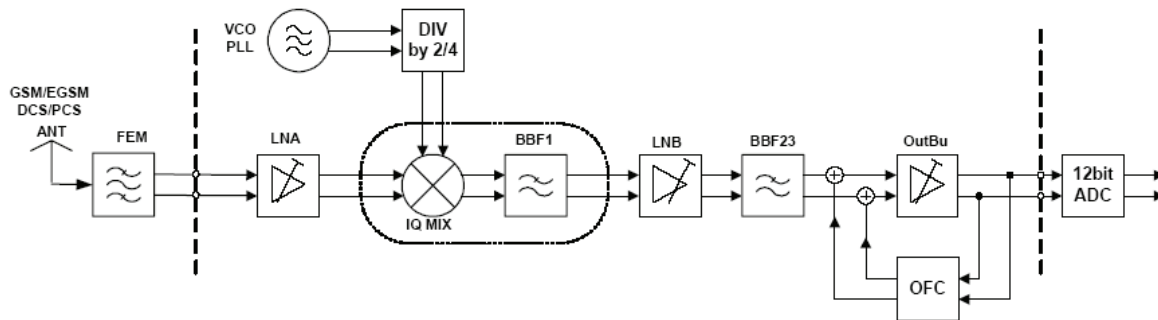


**Figure 3-32 Receiver part block diagram**

The constant gain direct conversion receiver contains all active circuits for a complete receiver chain for GSM/GPRS/EDGE (see Figure 39). The GSM850/900/DCS1800/ PCS1900 LNAs with balanced inputs are fully integrated. No inter-stage filtering is needed. The orthogonal LO signals are generated by a divider-by-four for GSM850/900 band and a divider-by-two for the DCS1800/PCS1900 band. Down conversion to baseband domain is performed by low/high band quadrature direct down conversion mixers. The baseband chain contains a LNB (low noise buffer), channel filter, output buffer and DC-offset compensation. The 3rd order low pass filter is fully integrated and provides sufficient suppression of blocking signals as well as adjacent channel interferers and avoids anti-aliasing through the baseband ADC. The receive path is fully differential to suppress on-chip interferences. Several gain steps are implemented to cope with the dynamic range of the input signals. Depending on the baseband ADC dynamic range, single- or multiple gain step switching schemes are applicable. Furthermore an automatic DC-offset compensation can be used (depending on the gain setting) to reduce the DC-offset at baseband-output. A programmable gain correction can be applied to correct for front end- and receiver gain tolerances.

## 3.18 Transmitter part

The GMSK transmitter supports power class 4 for GSM850 and GSM900 as well as power class 1 for DCS1800 and PCS1900. The digital transmitter architecture is based on a very low power fractional-N Sigma-Delta synthesizer without any external components (see Figure39). The analog I/Q modulation data from the baseband is converted to digital, filtered and transformed to polar coordinates. The phase/frequency signal is further on processed by the Sigma-Delta modulation loop. The output of its associated VCO is divided by four or two, respectively, and connected via an output buffer to the appropriate single ended output pin. This configuration ensures minimum noise level. The 8PSK transmitter supports power class E2 for GSM850 and GSM900 as well as for DCS1800 and PCS1900. The digital transmitter architecture is based on a polar modulation architecture, where the analog modulation data (rectangular I/Q coordinates) is converted to digital data stream and is subsequently transformed to polar coordinates by means of a CORDIC algorithm. The resulting amplitude information is fed into a digital multiplier for power ramping and level control. The ready processed amplitude signal is applied to a DAC followed by a low pass filter which reconstructs the analog amplitude information. The phase signal from the CORDIC is applied to the Sigma-Delta fractional-N modulation loop. The divided output of its associated VCO is fed to a highly linear amplitude modulator, recombining amplitude and phase information. The output of the amplitude modulator is connected to a single ended output RF PGA for digitally setting the wanted transmit power. The PA interface of SMARTi-PM supports direct control of standard dual mode power amplifiers (PA's) which usually have a power control input VAPC and an optional bias
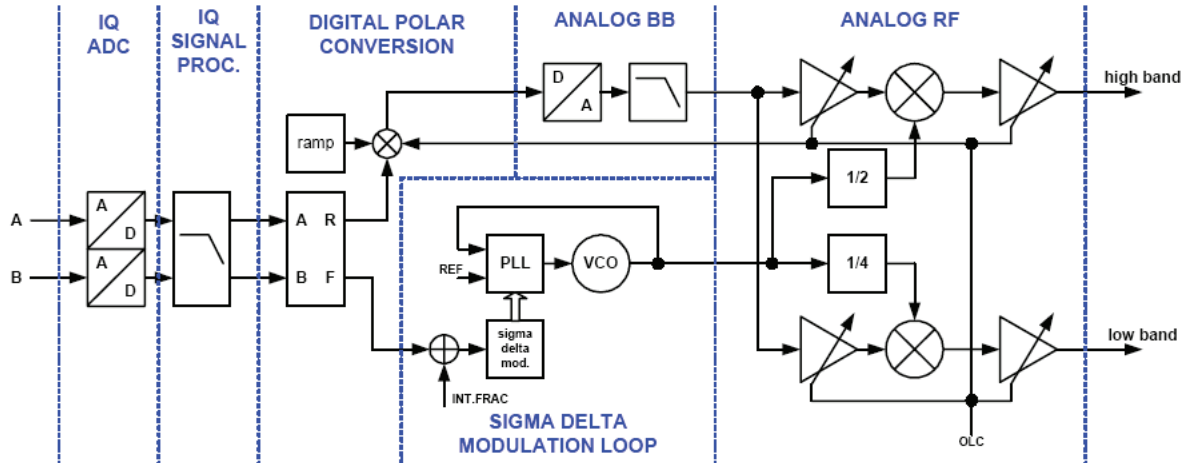


**Figure 3-33 Transmitter part block diagram**

control pin VBIAS for efficiency enhancement. In GMSK mode, the PA is in saturated high efficiency mode and is controlled via its VAPC pin directly by the baseband ramping DAC. In this way both up- / down-ramping and output power level are set. In 8PSK mode, the ramping functionality is assured by an on-chip ramping generator, whereas output power is controlled by the PGA's as described above.

## 3.19 RF synthesizer

The transceiver contains a fractional-N sigma-delta synthesizer for the frequency synthesis in the RX operation mode. For TX operation mode the fractional-N sigma-delta synthesizer is used as Sigma-Delta modulation loop to process the phase/frequency signal. The 26MHz reference signal is provided by the internal crystal oscillator. This frequency serves as comparison frequency of the phase detector and as clock frequency for all digital circuitry.The divider in the feedback path of the synthesizer is carried out as a multi-modulus divider (MMD). The loop filter is fully integrated and the loop bandwidth is about 100 kHz to allow the transfer of the phase modulation. The loop bandwidth is automatically adjusted prior to each slot (OLGA$^2$). To overcome the statistical spread of the loop filter element values an automatic loop filter adjustment (ALFA) is performed before each synthesizer startup. The fully integrated quad-band VCO is designed for the four GSM bands (850, 900, 1800, 1900 MHz) and operates at double or four times transmit or receive frequency. To cover the wide frequency range the VCO is automatically aligned by a binary automatic band selection (BABS) before each synthesizer startup.

## 3.20 DCXO

The SMARTiPM contains a fully integrated 26MHz digitally controlled crystal oscillator (DCXO) with three outputs for the system clock, one output for the GSM baseband and two additional for other subsystems (GPS, Bluetooth, etc.).The only external part of the oscillator is the crystal itself. The frequency tuning is performed along the selected subrange by programming the frequency control word (XO_TUNE) via the three wire bus ("3Wbus")
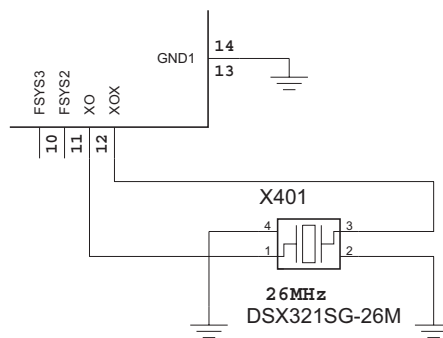


**Figure 3-34 DCXO Schematic**

## 3.21 Front End Module control

Implemented in the S-Gold3 (FL600) are two outputs which are FE1, FE2 for direct control of front end modules with two logic input pins to select RX and TX mode as well as low and high band operation. FEM need 2V85_VRF supply.

**Table 3-15 FEM Control Logic**

| MODE | Tx 1GHz | Tx 2GHz | Rx 1GHz | Rx 2GHz |
|------|---------|---------|---------|---------|
| VDD  | ON      | ON      | ON      | ON      |
| VC1  | OFF     | ON      | OFF     | ON      |
| VC2  | ON      | ON      | OFF     | OFF     |



**Figure 3-35 FEM schematic**

## 3.22 Power Amplifier Module

The TQM7M5005H Power Amplifier Module(PAM) is designed in a compact from fact for quad-band cellular handsets comprising GSM850/900,DCS1800,PCS1900,supporting GMSK and linear EDGE modulation. Class12 General Packet Radio Service(GPRS) multi-slot operation is also supported.
The module consists of a GSM850/900 PA block and a DCS1800/PCS1900 PA block,impedance matching circuitry for 50ohm input and output impedances, and a Multi-function Power Amplifier Control(MFC) block. A custom CMOS integrated circuit provides the internal MFC function and interface circuitry.
Two separate Heterojunction Bipolar Transistor(HBT) PA blocks are fabricated onto InGaP die; one supports the GSM850/900 bands, the other supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pins to distribute current. The InGaP die, the silicon die, nad the passive components are mounted on a multi layer laminate substrate. The assembly is encapsulated with plastic overmold.
RF input and output ports are internally matched to 50ohm to reduce the number of external components Extremely low leakage current(2.5uA) maximizes handset standby time. Band select(BS) circuitry select GSM transmit frequency band(logic0) and DCS/PCS transmit frequency(logic1). MODE circuitry selects GMSK modulation (logic0) or EDGE modulation(logic1). VRAMP controls the output power for GMSK modulation and provides bias optimization for EDGE modulation depending on the state of MODE control.
The integrated multi-function(MFC) provides envelope amplitude control in GMSK mode, reducing sensitivity to input drive, temp, power supply, and process variation. In EDGE mode, the MFC configures the PA for fixed gain, and provides the ability to optimize the PA bias operation at different power levels, This circuitry regulates PA bias conditions, reducing sensitivity to temp., power supply, and process variation. The Enable input signal(pin8) provides a standby state to minimize battery drain..

### .Table 3-16 PAM pin description

| Pin # | Description | Function |
|---|---|---|
| 1 | DCS / PCS in | DCS/PCS RF input -- DC blocked |
| 2 | MODE SELECT | MODE = High, the PAM operates in EDGE (8PSK) mode<br>MODE = Low, the PAM operates in GMSK mode. |
| 3 | BAND SELECT (BS) | BAND SELECT = Low, Low-Band active<br>BAND SELECT = High, High-Band active |
| 4 | VBATT | Battery supply voltage, typ. 3.0 – 4.5 V, nom. 1.6A |
| 5 | VRAMP | DAC Control Signal (analog).      Nominal Vramp range is 0.2 to 1.6V<br>GMSK mode – Controls ramp profile and output power.<br>EDGE mode – Controls ramp profile |
| 6 | TX_EN | TX_EN = High, PA is enabled for operation.<br>TX_EN = Low, PA is in sleep mode |
| 7 | GSM850 / 900 in | GSM850 / GSM900 RF input -- DC blocked |
| 10 | GSM850 / 900 out | GSM850 / GSM900 RF output -- DC blocked |
| 12 | DCS / PCS out | DCS / PCS RF output -- DC blocked |
| 9, 13 | Bypass Cap | Connect 0.01uF bypass capacitor as close to pin as practical. |
| 8, 11, 14, | GND | Ground |

## 3.23 PAM Schematic
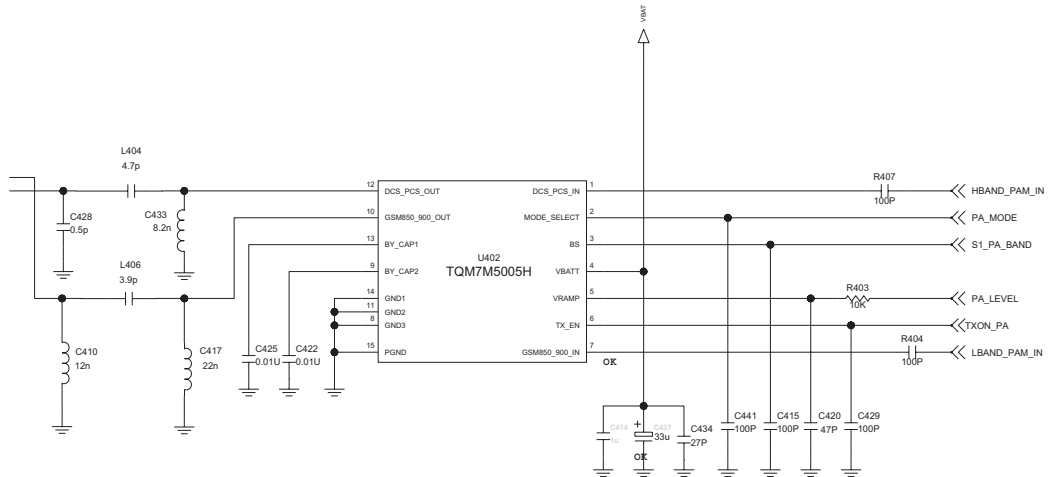


**Figure 3-36 PAM schematic**

# 4. TROUBLE SHOOTING

## 4.1 Trouble shooting test setup
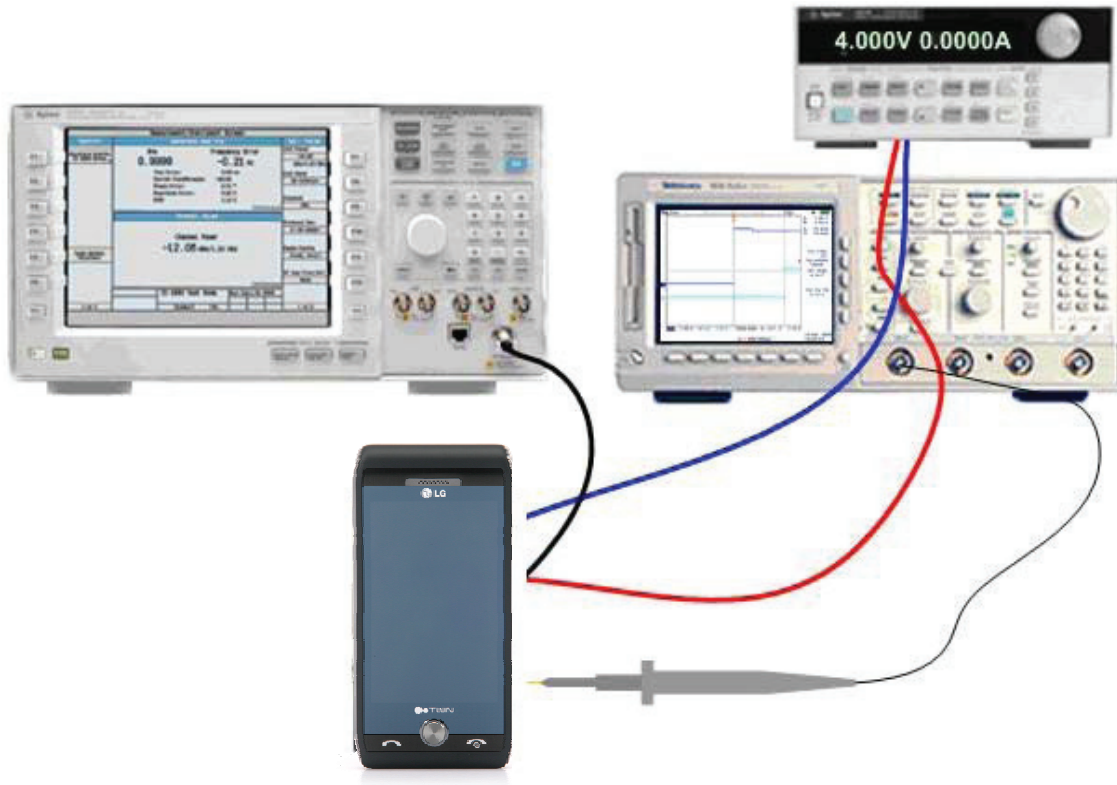


**Equipment setup**

**Power on all of test equipment**
-Connect PIF-UNION JIG or dummy battery to the DUT for power up.
-Connect mobile switch cable between Communication test set and DUT when you need to make a phone call.
-Follow trouble shooting procedure

## 4.2 Power on Trouble

**Check Points**

-Battery Voltage( Need to over 3.35V)
-Power-On Key detection (PWRON signal)
-Outputs of LDOs from PMIC

Remote Power On
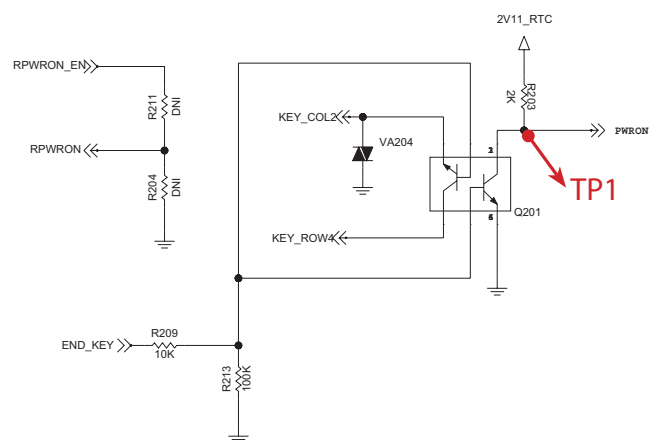


**Figure 4-1. Remote Power On Circuit**
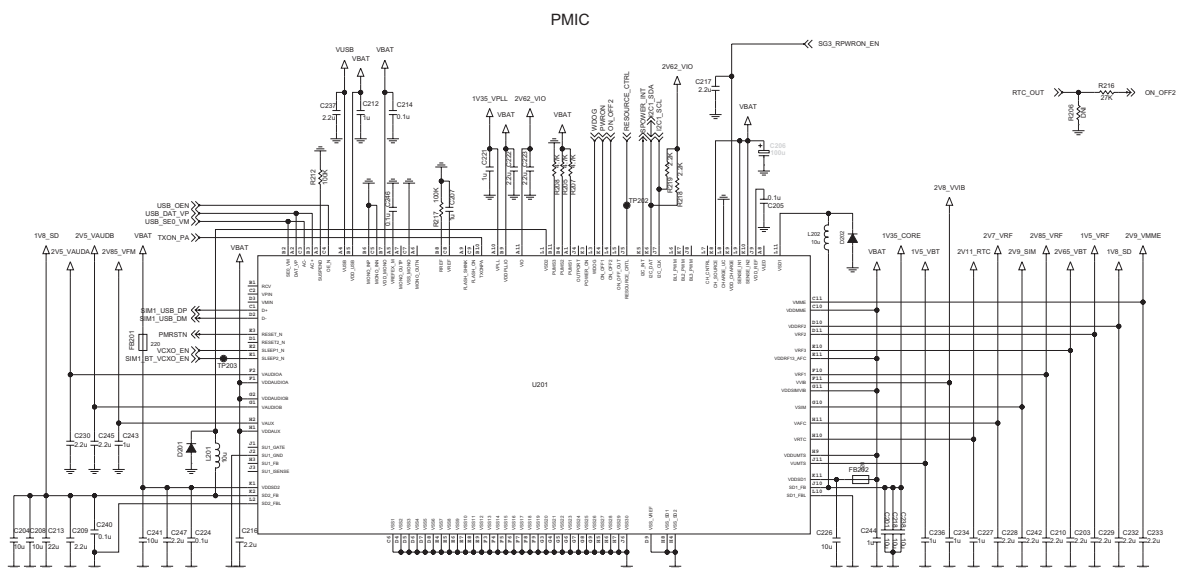


**Figure 4-2. PMIC Circuit**

# 4. TROUBLE SHOOTING

**Table 4-1. PMIC GPIO PIN MAP**

| LDO | Net name | Output Voltage | Output Current | Usage |
|---|---|---|---|---|
| SD1 | 1V35_Core | 1.35V | 600mA | Core & for LDO |
| SD2 | 1V8_SD | 1.8V | 300mA | Memory |
| VAUX | 2V85_VFM | 2.9V | 100mA | LCD |
| VIO | 2V62_VIO | 2.62V | 100mA | Peripherals |
| VSIM | 2V9_SIM | 2.9V | 70mA | SIM card |
| VMME | 2V8_VMME | 2.9V | 150mA | u-SD |
| VUMTS | 1V5_VBT | 2.85V | 110mA | Not used |
| VUSB | VUSB | 3.1V | 40mA | Not used |
| VLED | VLED | 2.9V | 10mA | Not used |
| VAUDIOa | 2V5_VAUDA | 2.5V | 200mA | Stereo headset, Mono earpiece |
| VAUDIOb | 2V5_VAUDB | 2.5V | 50mA | Analog parts of S-Gold |
| VRF1 | 2V85_VRF | 2.85V | 150mA | 2.85 V supply for SMARTi-PM RF transceiver |
| VRF2 | 1V5_VRF | 1,53V | 100mA | 1.5 V supply for SMARTi-PM RF transceiver |
| VRF3 | 2V65_VBT | 2.7V | 150mA | Bluetooth |
| VPLL | 1V35_VPLL | 1.35V | 30mA | S-GOLD3 PLL |
| VRTC | 2V11_RTC | 2.11V | 4mA | Real Time Clock |
| VAFC | VAFC | 2.65V | 5mA | Not used |
| VVIB | 2V8_VVIB | 2.8V | 140mA | Vibrator |

**Checking Flow**



START

↓

Connect power supply to the DUT Vbat = over 3.35V

↓ Yes

"PWRON" signal Check 3 pin of U203 → No → Check the RPWRON, replace Q201

↓ Yes

Check the all LDO's output Is it correct? → No → Check solder U201 or replace it

↓ Yes

Is the 26MHz clock From X401 signal correct? → No → Check solder X401 or replace it

Check 3 pin of X401 Or Check 11 pin of U401

↓ Yes

Replace main PCB



TP1

Q201

**Figure 4-3. RPWRON**



U201
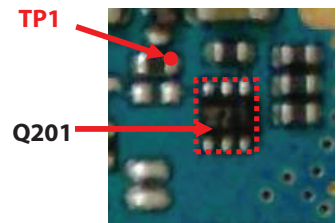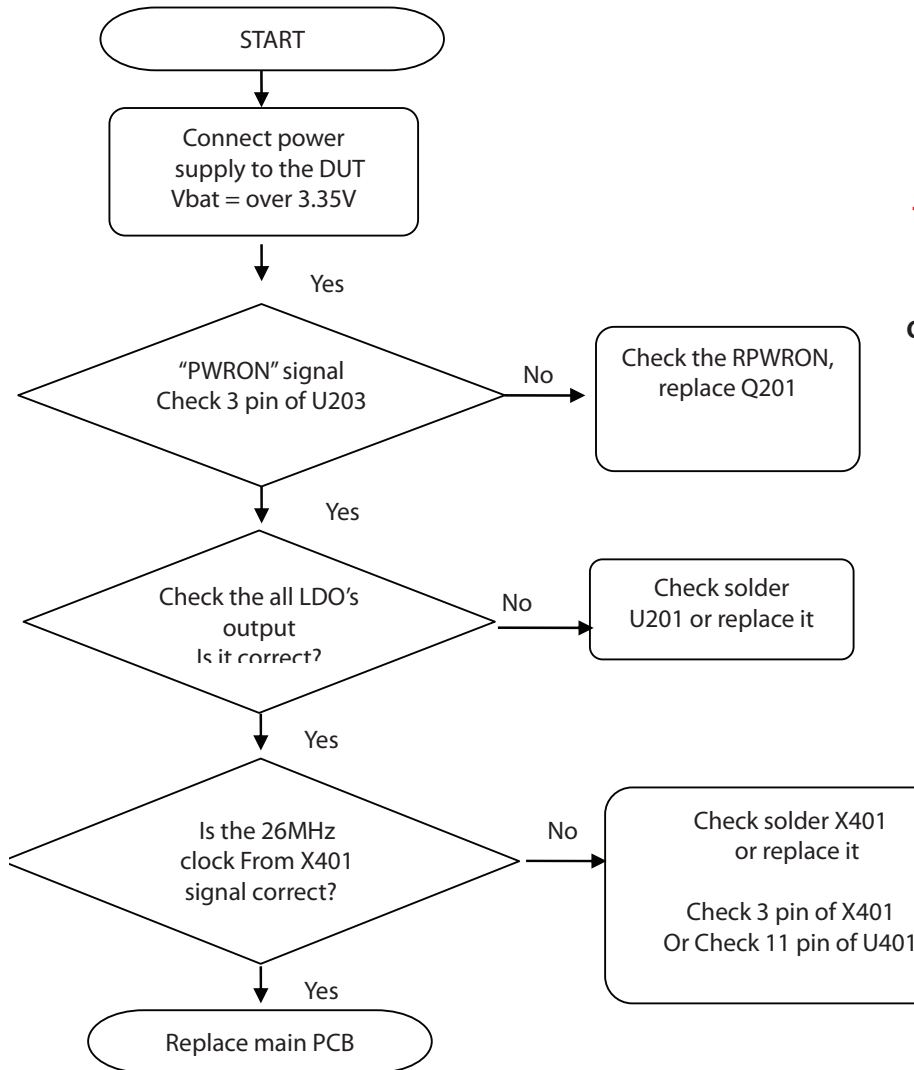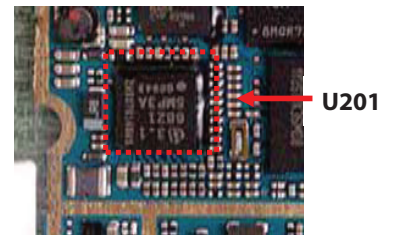
**Figure 4-5. X-TAL & Transceiver**



X401

14pin of U401

U401

1pin of X401
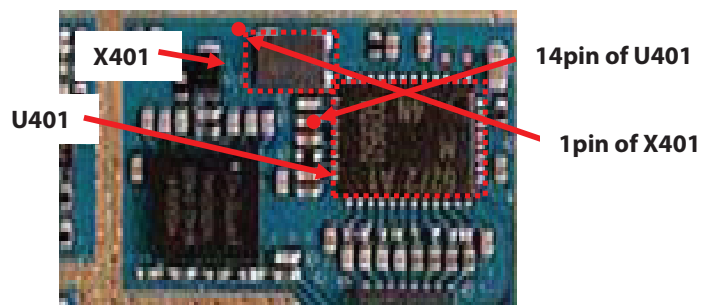
## 4.3 Charging trouble

**Check Points**

-Connection of TA (check TA voltage 4.8V)
-Charging Current Path component voltage drop
-Battery voltage

1 Charging method : CC-CV
2 Charger detect voltage : 4.8 V
3 Charging time : 3h 15m
4 Charging current   :   680 mA
5 CV voltage : 4.2 V
6 Cutoff current    : 120 mA
7 Full charge indication current (icon stop current) : 120 mA
8 Recharge voltage : 4.16 V

| 4.2V~3.75V | 3.75V~3.65V | 3.65V~3.58V | 3.58V~3.30V |

## SINGLE CHARGING IC



**Figure 4-6. Charging circuit**

```
                    ┌─────────────┐
                    │    START    │
                    └──────┬──────┘
                           │
                           ▼
                    ╱───────────────╲
                   ╱  18pin IO(CN401) ╲      No    ┌──────────────────┐
                   ╲   Is soldered ?  ╱─────────▶  │ Resolder the CN301│
                    ╲───────────────╱             └──────────────────┘
                           │ Yes
                           ▼
                    ╱───────────────╲             ┌──────────────────┐
                   ╱    Source pin    ╲    No       │  The TA can be    │
                   ╲  of U401 = 4.8V ? ╱─────────▶  │    broken         │
                    ╲───────────────╱             │ Change other TA   │
                           │ Yes                   │   then retest     │
                           ▼                        └──────────────────┘
                    ╱───────────────╲             ┌──────────────────┐
                   ╱    Output pin    ╲    No       │  Check solder     │
                   ╲  of U310 =4.2V?   ╱─────────▶  │ U310 or replace it│
                    ╲───────────────╱             └──────────────────┘
                           │ Yes
                           ▼
                    ╱───────────────╲             ┌──────────────────┐
                   ╱  Battery voltage  ╲   No       │  Waiting until    │
                   ╲   is over 3.4V?   ╱─────────▶  │    battery        │
                    ╲───────────────╱             │ Voltage goes up to│
                           │ Yes                   │      3.4V         │
                           ▼                        └──────────────────┘
                    ╱───────────────╲             ┌──────────────────┐
                   ╱ Battery thermistor╲   No       │ Change the Battery│
                   ╲     value         ╱─────────▶  │     retest        │
                   ╲  is about 10K?    ╱            └──────────────────┘
                    ╲───────────────╱
                           │ Yes
                           ▼
                ┌────────────────────────┐
                │ Charge is operating     │
                │      properly           │
                └────────────────────────┘
```
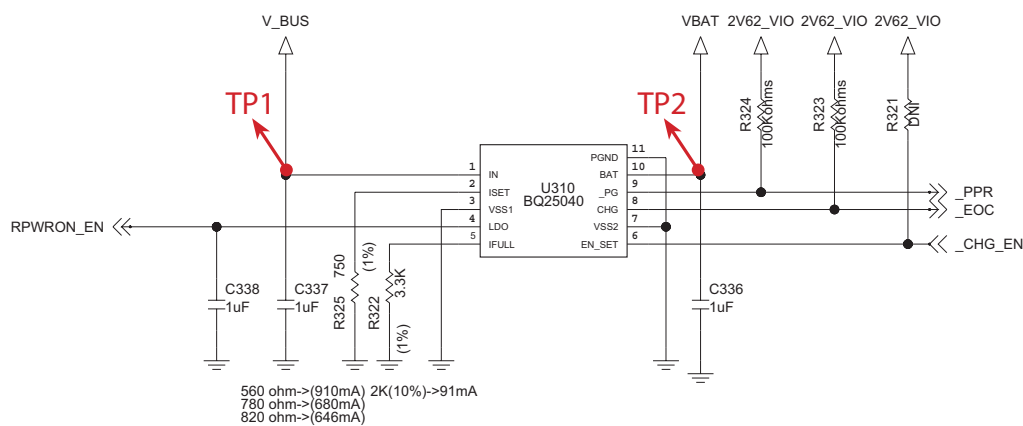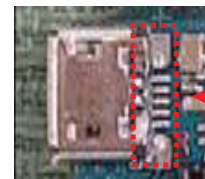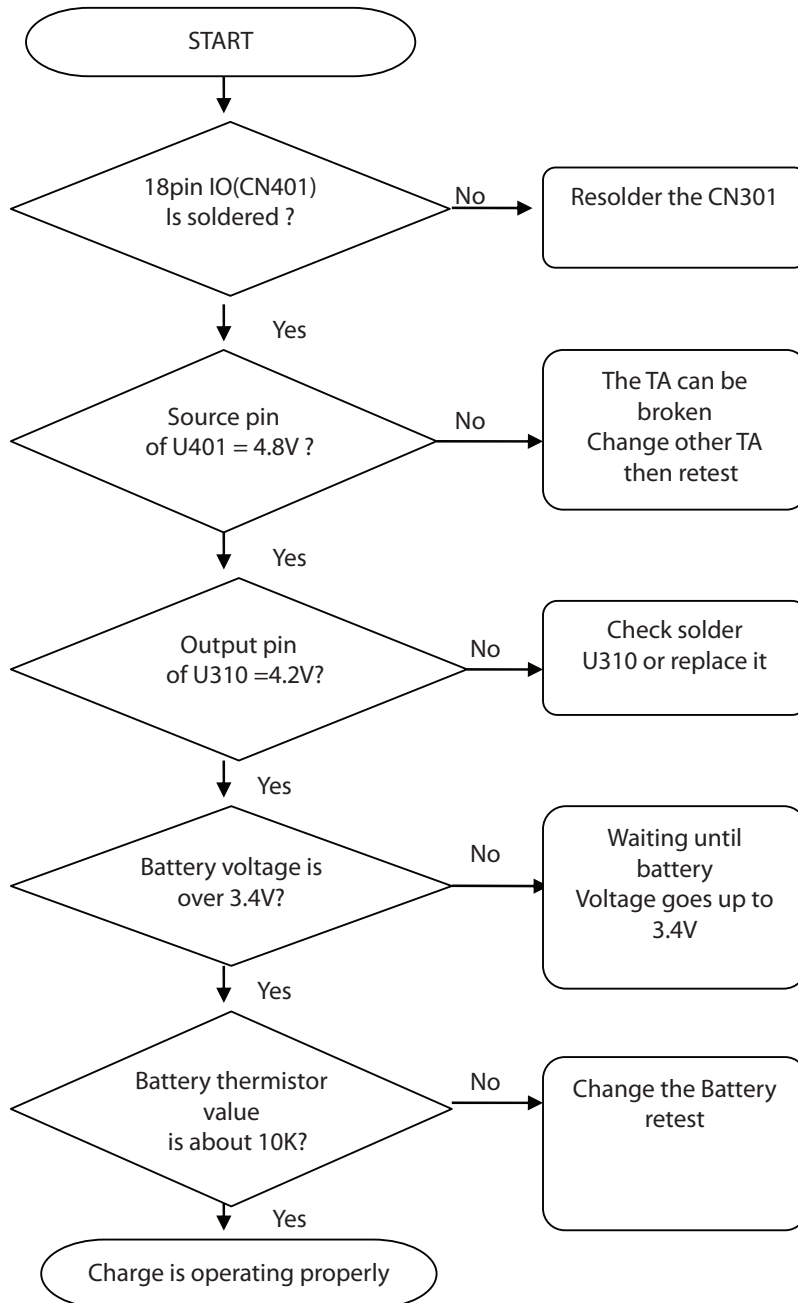
**5pin IO(CN301)**

**Figure 4-7. IO Connector**
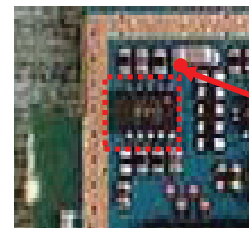
**U310**
**TP1: Source pin**
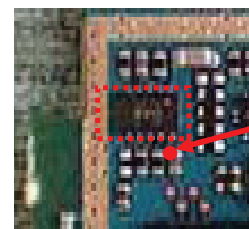
**U310**
**TP2: Output pin**

**Figure 4-8. USB SWITCH**

## 4.4 LCD display trouble

**Check Points**

-LCD assembly status ( LCD FPCB, Connector on FPCB)
-EMI filter soldering
-Connector combination

LCD CONNECTOR

**Check signal flow via EMI filter**

**Check the connection LCD FPCB Connector**

**Figure 4-10. LCD FPCB Connector**

**Charge Pump**

**Figure 4-11. Charge Pump**

**Checking Flow**

```
          ┌─────────────┐
          │    START    │
          └─────────────┘
                 │
                 ▼
     ┌───────────────────────┐
     │ Check LCD connector   │
     │ combination then LCD  │
     │ test with New LCD     │
     └───────────────────────┘
                 │
                 ▼
            Is LCD          No      ┌─────────────┐
            normal?   ──────────▶   │ Replace LCD │
                                    └─────────────┘
                 │ Yes
                 ▼
        Signal is normal on    No   ┌───────────────────────┐
          DIF Signal      ────────▶ │ Check solder and repair│
        FL803, FL804, FL805         │ Damaged filter         │
                                    └───────────────────────┘
                 │ Yes
                 ▼
          ┌─────────────┐
          │  Assemble   │
          └─────────────┘
```
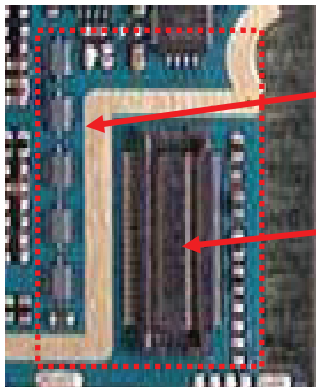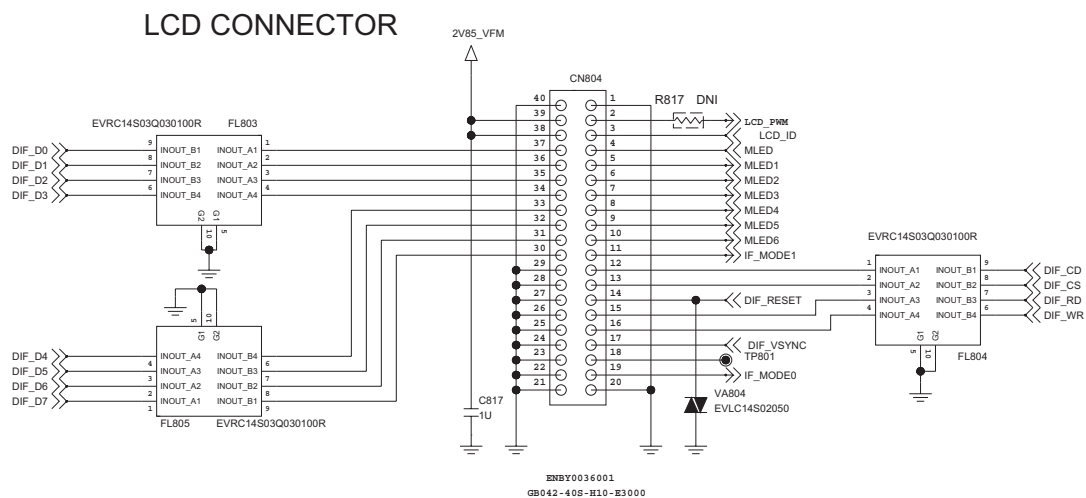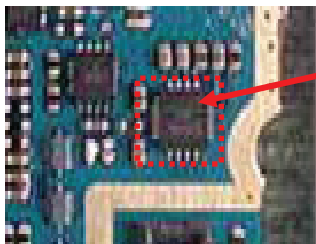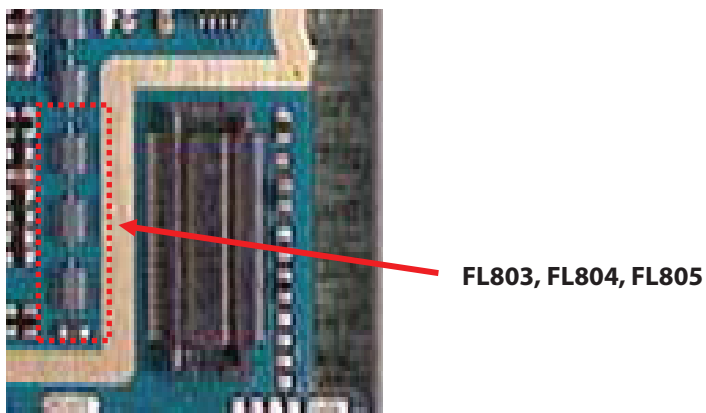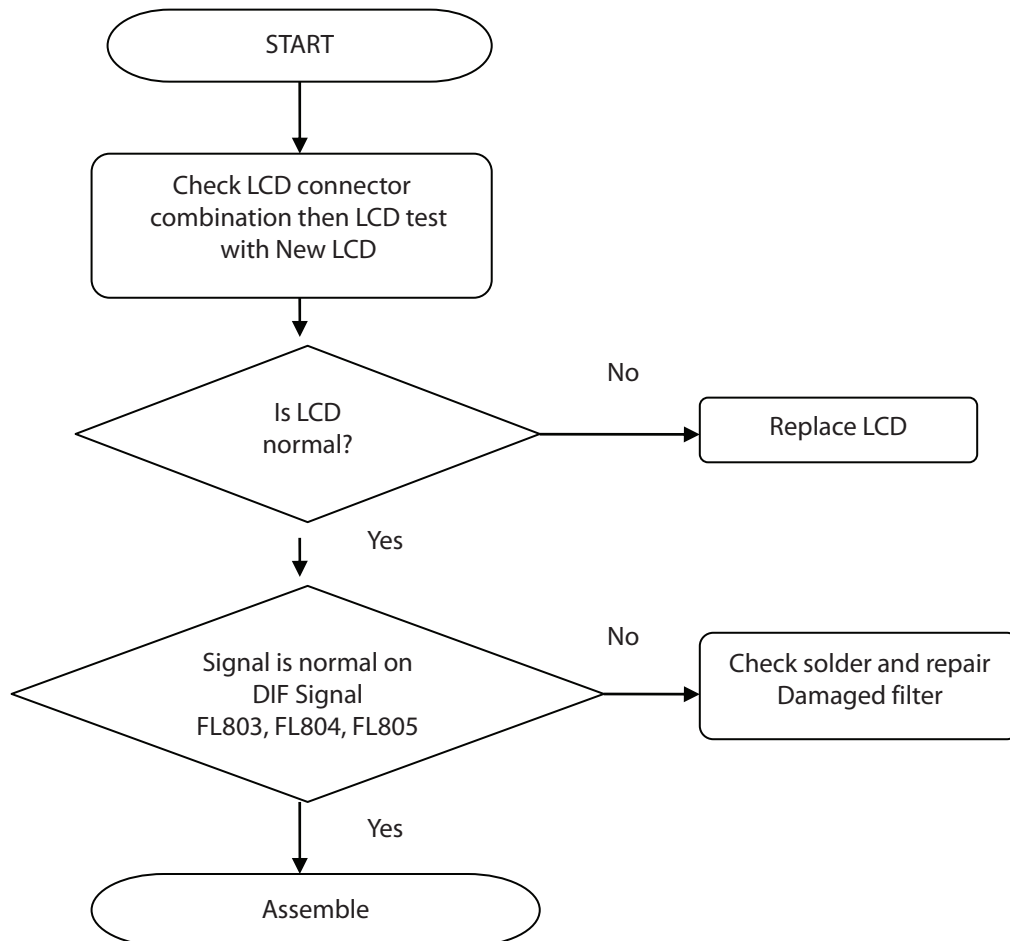
**FL803, FL804, FL805**

**Figure 4-11. EMI Filter**

## 4.5 Camera Trouble

**Check Points**

-Connectors combination
-FPCB status



**Figure 4-12. Camera**



**Check the Socket combination**
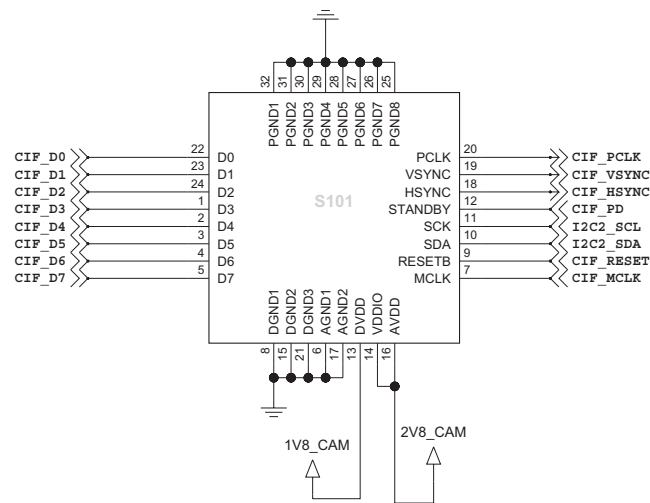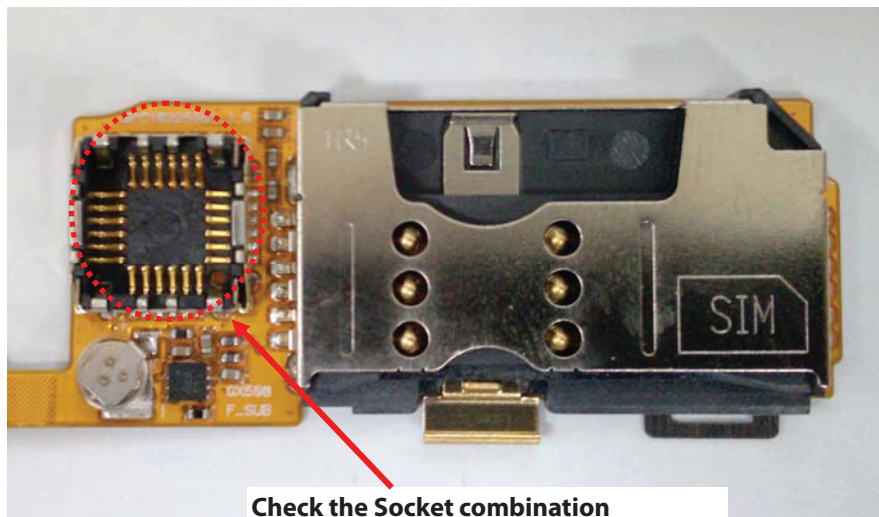
**Figure 4-13. SUB FPCB Assy**

**Checking Flow**

```
                    ┌─────────────────┐
                    │      START       │
                    └─────────────────┘
                             │
                             ▼
            ┌──────────────────────────────────┐
            │  Check camera socket,             │
            │   34pin combination then Camera   │
            │   test with equipped camera       │
            │   module                          │
            └──────────────────────────────────┘
                             │  Yes
                             ▼
                        ◇─────────◇
                   ┌───────────────────┐          No        ┌─────────────┐
                  ◇  Replace New Camera  ◇ ─────────────────▶│  Replace    │
                   │      module         │                   │  SUB PCB    │
                   │  Working properly?  │                   └─────────────┘
                    ◇─────────◇
                             │  Yes
                             ▼
            ┌──────────────────────────────────┐
            │  Replace Camera module            │
            └──────────────────────────────────┘
                             │  Yes
                             ▼
                    ┌─────────────────┐
                    │    Assemble      │
                    └─────────────────┘
```
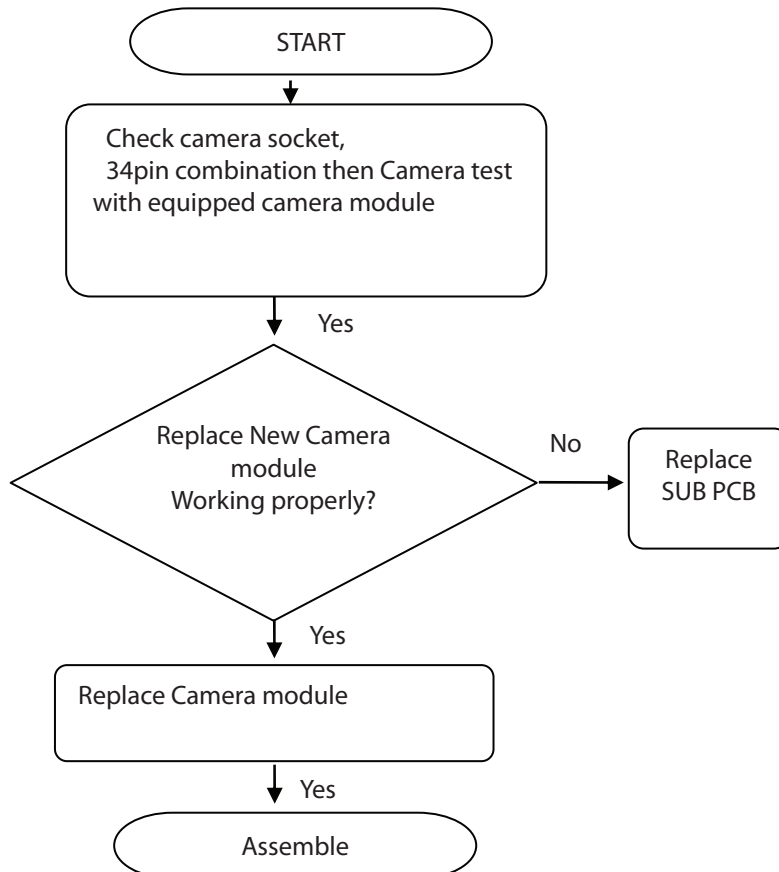
## 4.6 Receiver & Speaker trouble

**Check Points**

-Speaker contact
-Audio amp soldering

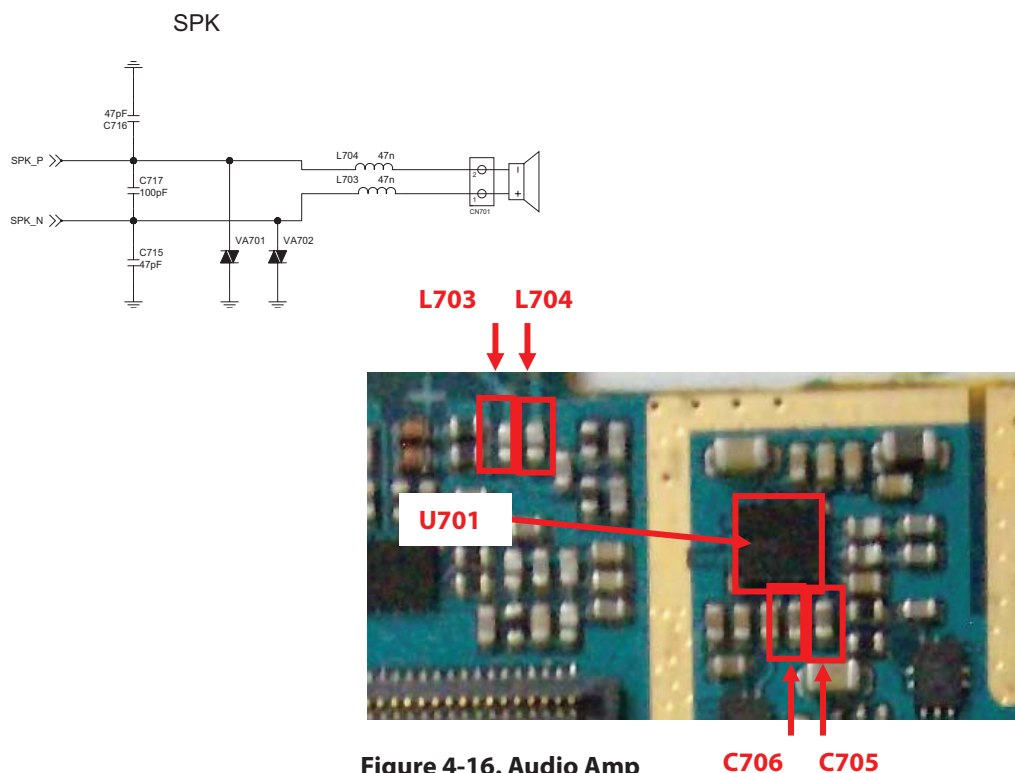AUDIO AMP SUB SYSTEM
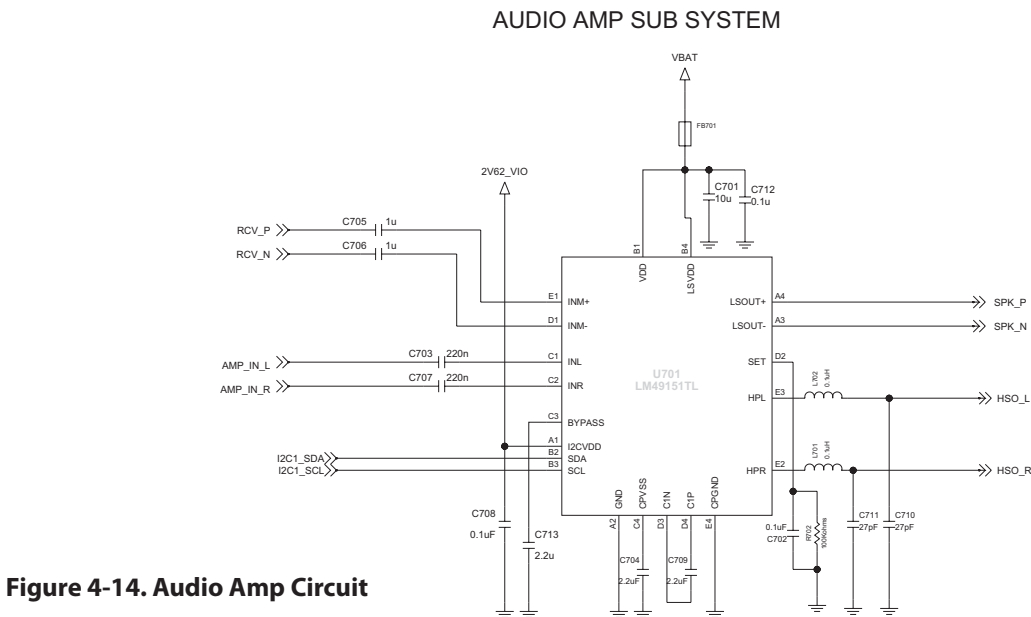
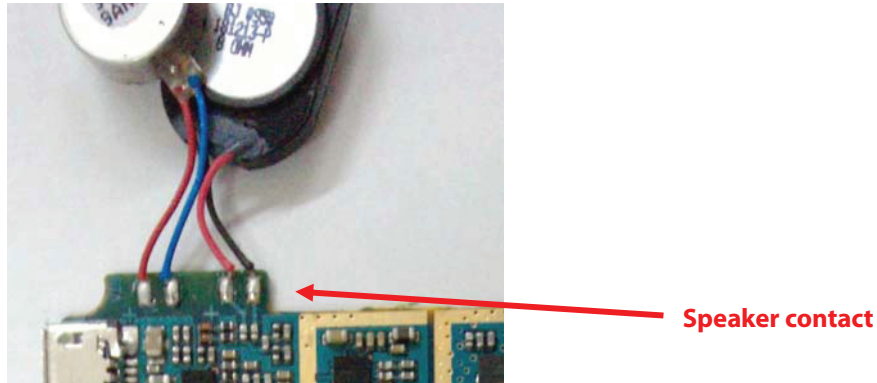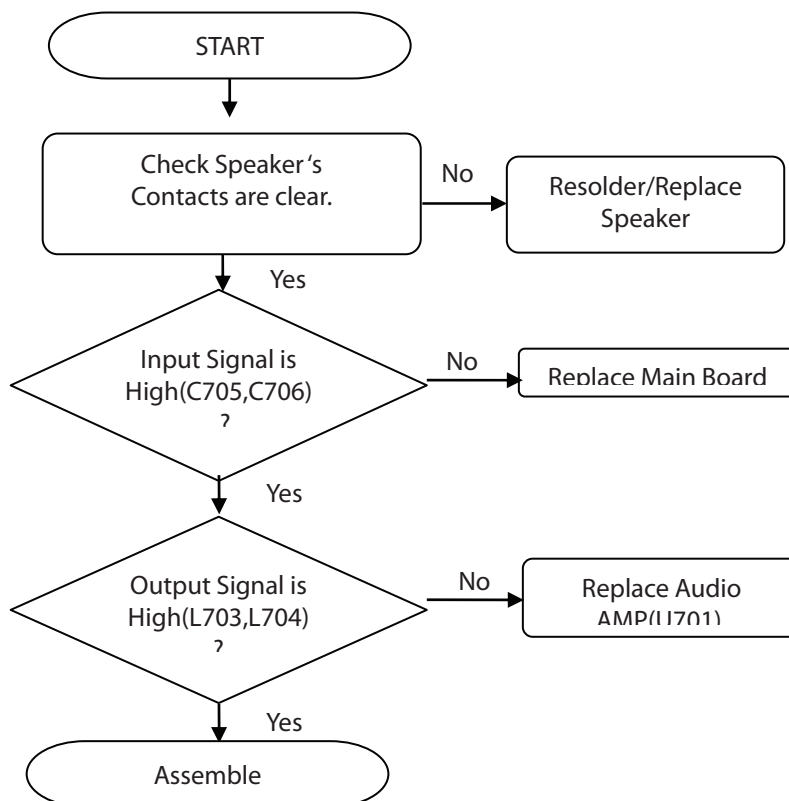**Figure 4-14. Audio Amp Circuit**

SPK



**Figure 4-16. Audio Amp**

**Figure 4-17. Speaker**

**Checking Flow**

## 4.7 Microphone trouble

**Check Points**

-Microphone hole
-Mic. Bias & signal line
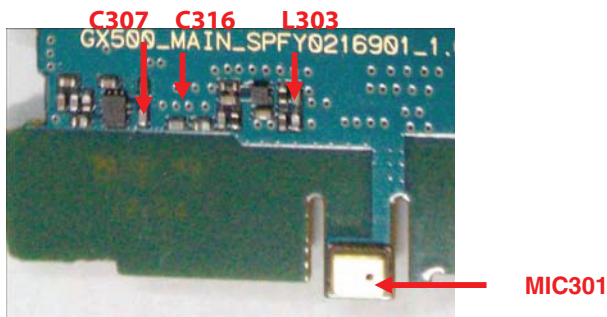


**Figure 4-18. Microphone**

**Checking Flow**



- 86 -
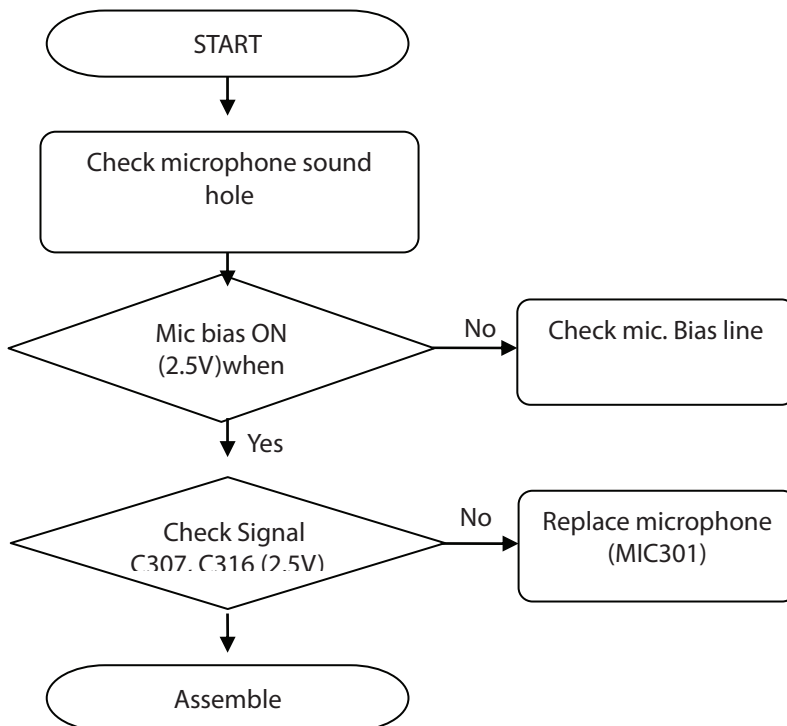
## 4.8 Vibrator trouble

**Check Points**

-Vibrator soldering
-IC is working correct

LINEAR MOTOR DRIVER
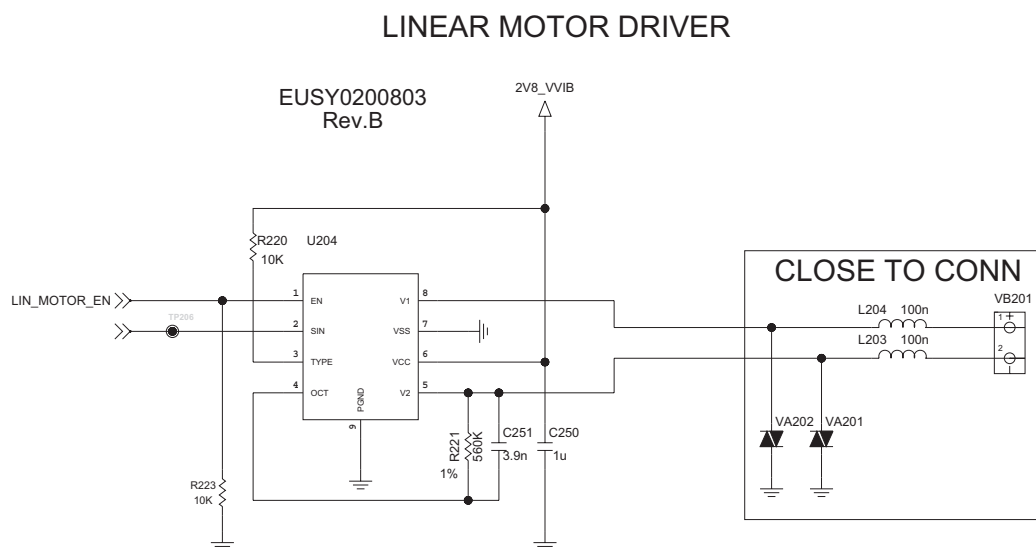
**Figure 4-19. LINEAR MOTOR DRIVER Circuit**
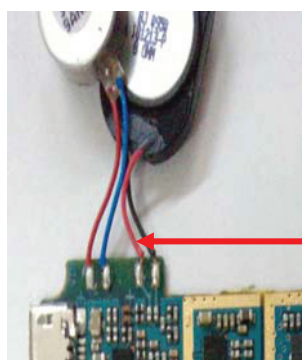
**Check the driver IC(U204) of sub boarad**

**Figure 4-20. Vibrator Driver**
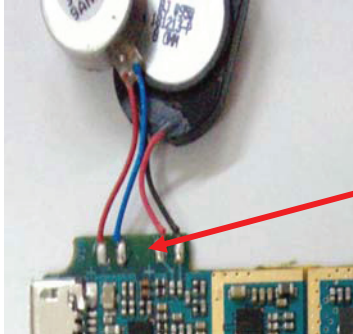
**Check the vibrator soldering**

**Figure 4-21. Vibrator**

**Checking Flow**



START

Check Vibrator sodering → **No** → Check FPCB_LCD or replace it

**Yes**

Pin1 of U204(VIB_EN) is → **No** → Replace Main Board

**Yes**

Pin3 of U204(VIB) is high? → **No** → Replace U204

**Yes**

Replace Vibrator

Assemble
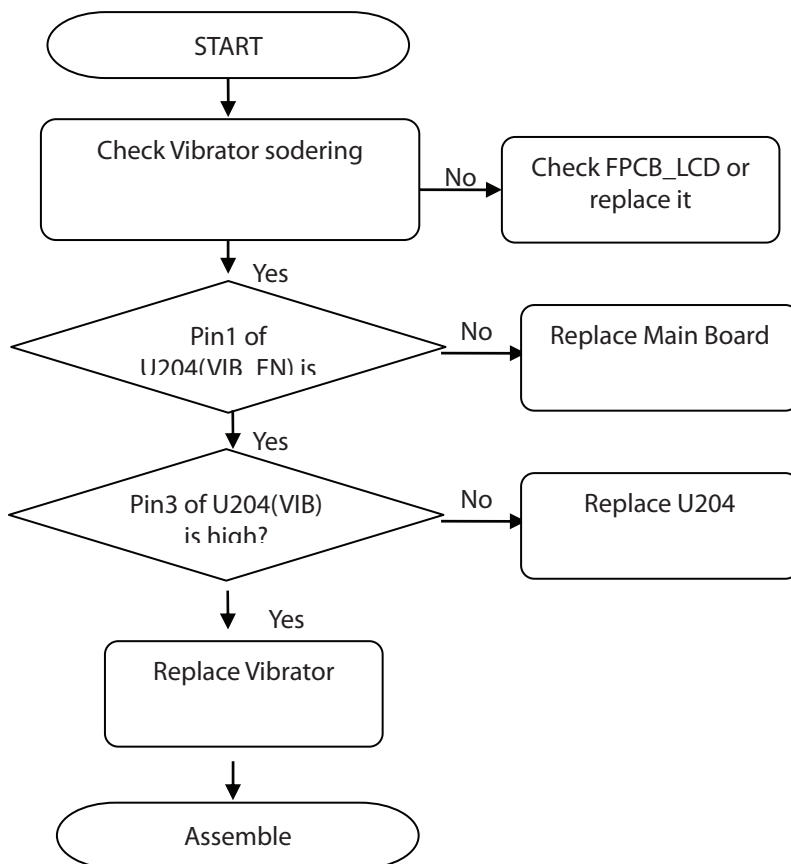
## 4.9 SIM & uSD trouble

**SIM Check Points**
-Power is working
-Socket soldering
-Proper SIM is used
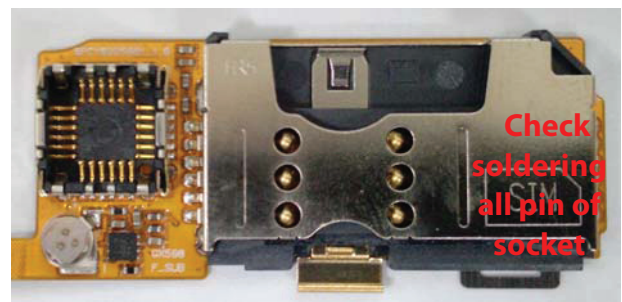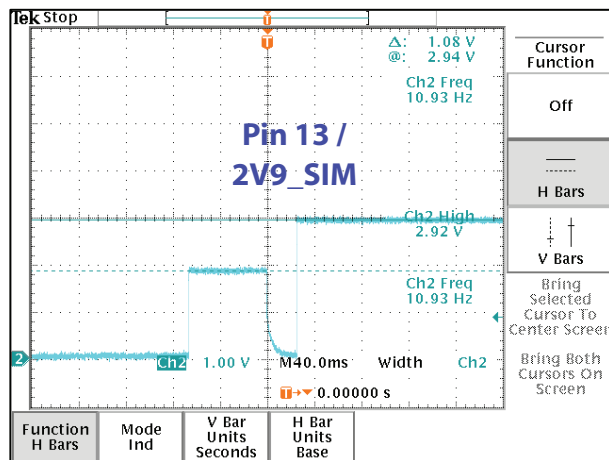




**Figure 4-22. SUB FPCB Assy**
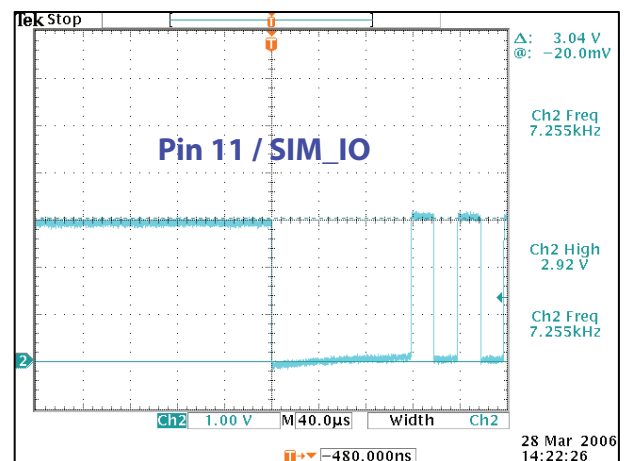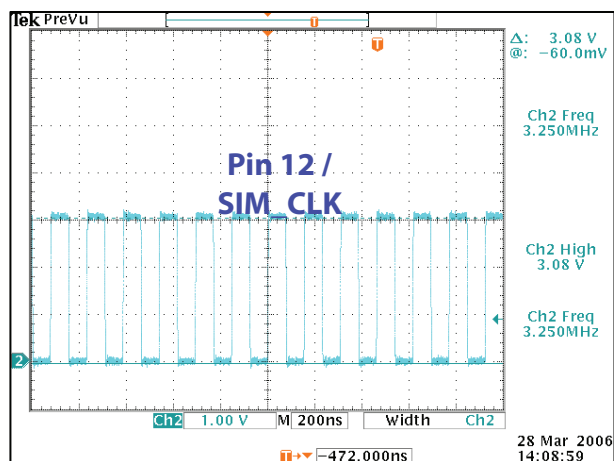




**Figure 4-23. SIM CLK**

# 4. TROUBLE SHOOTING

**Checking Flow**

START

Check All of SIM card voltage
GX500 support
2.9V SIM only

16 pins are
soldered well? → No → Resolder pin

Yes

Check Proper SIM
Card → Yes → Replace SUB Board

Assemble
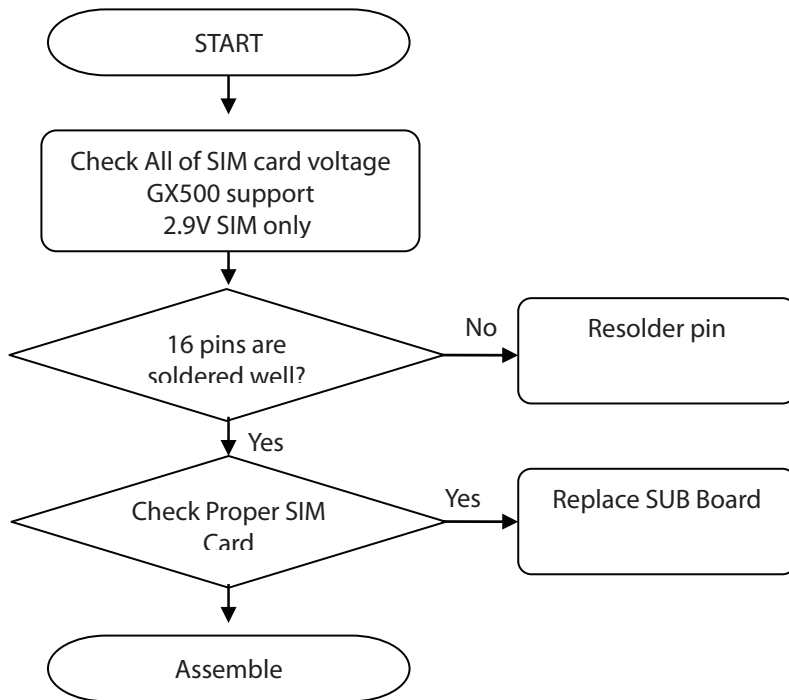
**uSD Check Points**

-Power is working
-Socket soldering
-Card detect is working

MMC-DETECT PIN

MMC_DETECT SIGNAL

**Figure 4-24. uSD**

**Card insert**                                **Card Deject**
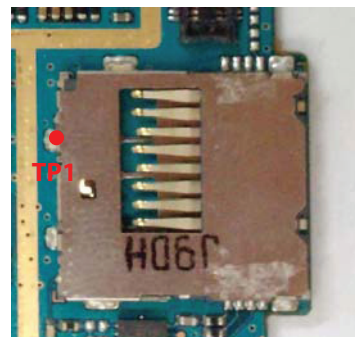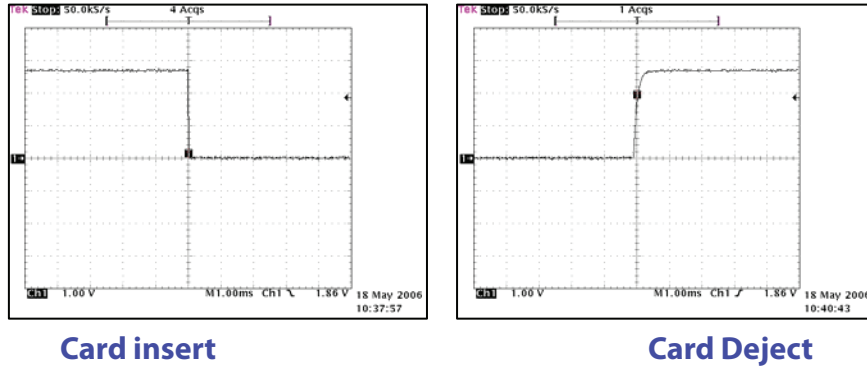
**Figure 4-25. MMC_DETECT SIGNAL**

**Checking Flow**



START

Check Micro SD card voltage
(2V9_VMME)

TF socket pins
are well soldered

No → Resolder it
(check data line
TP 1 is 2.9V Signal)

Yes

Check proper
uSD?

Yes → Replace Main Board

Assemble
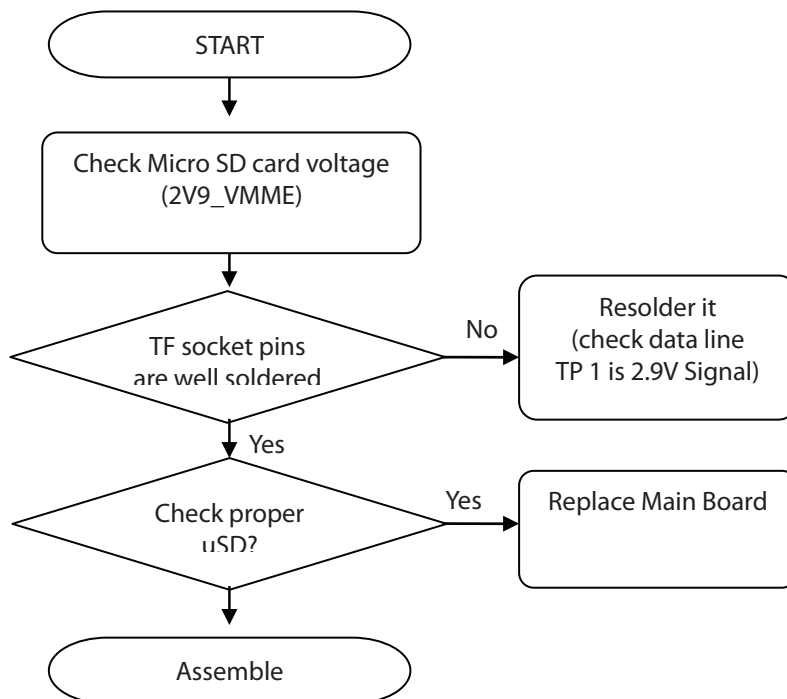
## 4.10 Touch trouble

**Check Points**

- Touch driver IC soldering`
- FPCB_Folder Crack

TOUCH IC
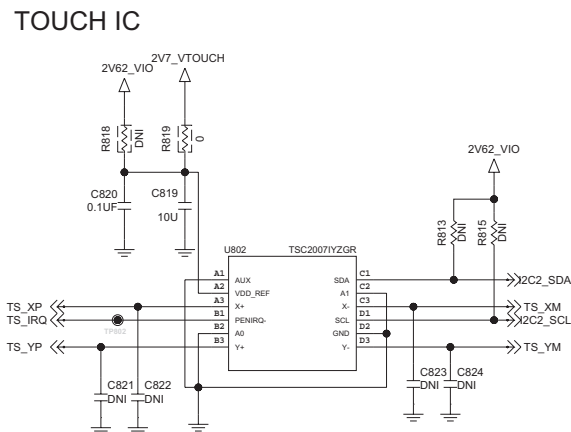


**Figure 4-26. Touch driver IC Circuit**

**Checking Flow**
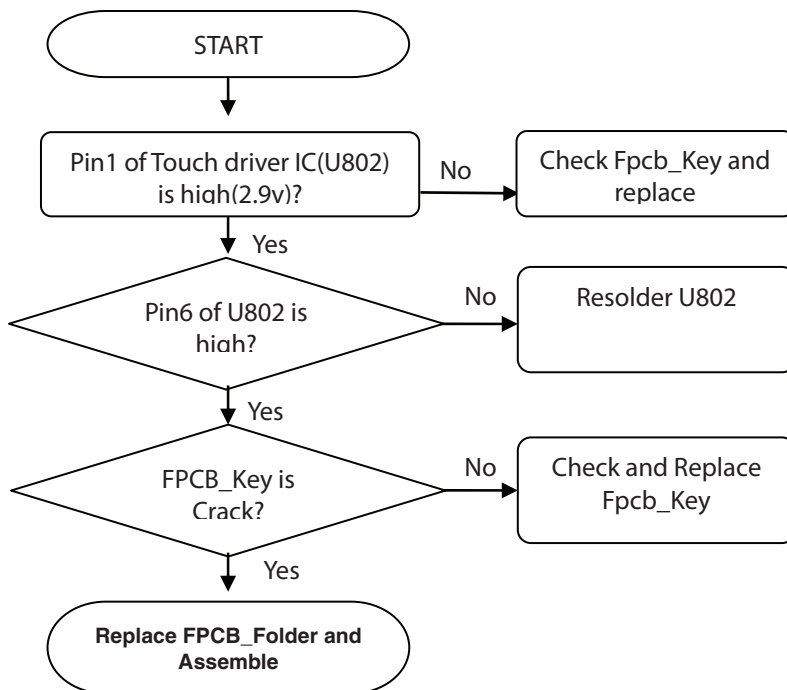
## 4.11 LCD LED trouble

**Check Points**

-Signal path is connected well

LCD BACKLIGHT  LED DRIVER
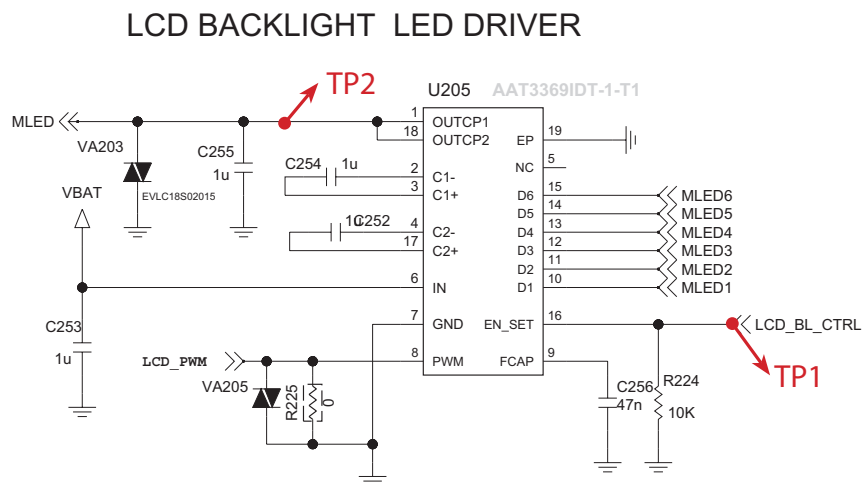
**Figure 4-27. LCD BACKLIGHT LED DRIVER Circuit**

**Checking Flow**

START

Check All of LEDs solder

Check TP1 is hIgh ? — No → Check R224 and Replace

Yes

Check TP2 is high? — No → Check and Replace charge pump. (U205)

Yes

Assemble
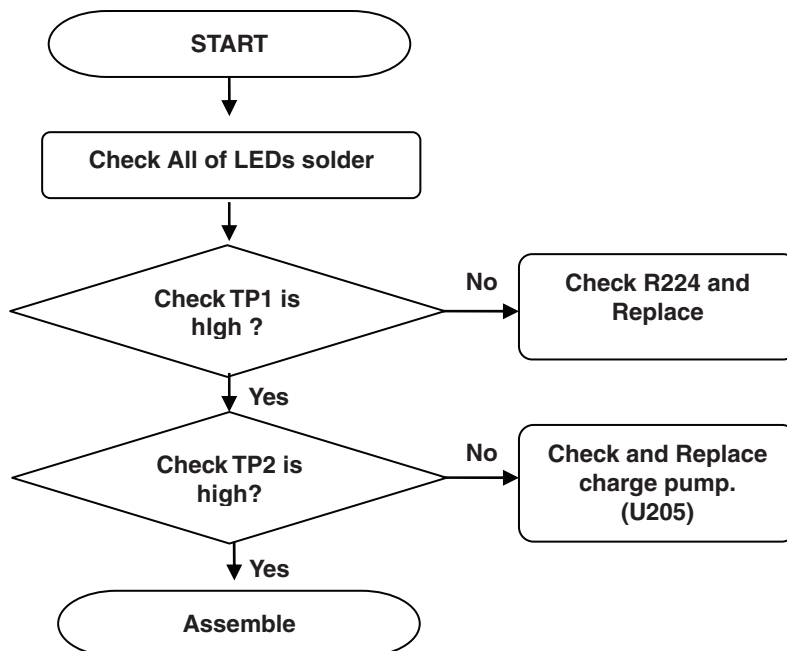
## 4.12 Trouble shooting of Receiver part

**Checking Flow**
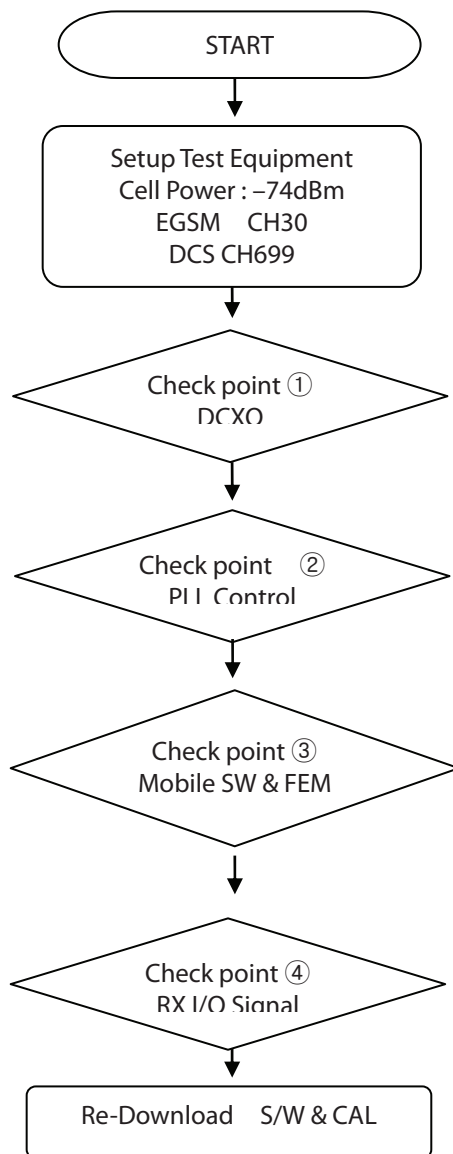
**Checking Points**

**Figure 4-28. Main PCB SIM1**



```
START
  │
  ▼
Setup Test Equipment
Cell Power : −74dBm
EGSM    CH30
DCS CH699
  │
  ▼
Check point ①
DCXO
  │
  ▼
Check point ②
PLL Control
  │
  ▼
Check point ③
Mobile SW & FEM
  │
  ▼
Check point ④
RX I/O Signal
  │
  ▼
Re-Download   S/W & CAL
```
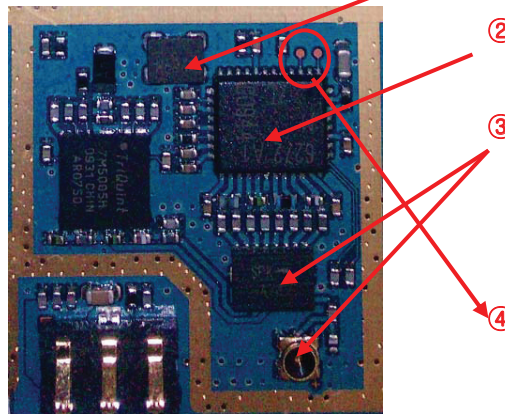
**Figure 4-29. Main PCB SIM2**
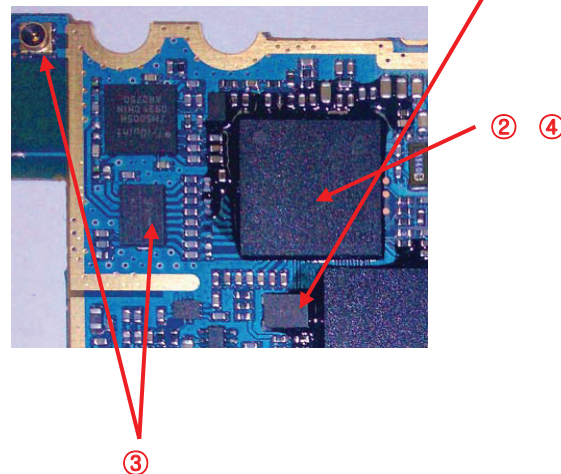
## 4.12.1 Checking DCXO Circuit

**Checking Points**
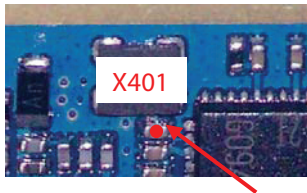


**TP1(C406) : 26MHz**

**Figure 4-30. DCXO (SIM1)**



X502
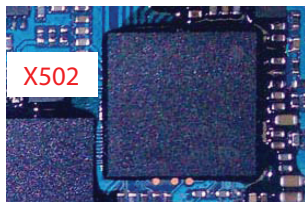
**Figure 4-31. DCXO (SIM2)**

**DCXO Circuit Diagram**



TP1
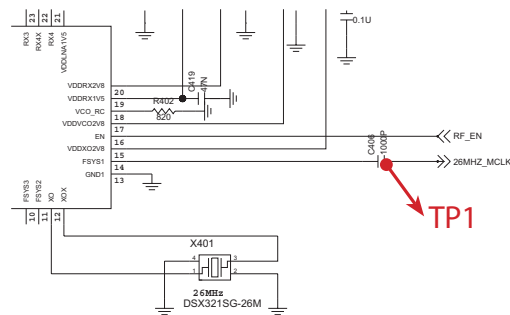
**Figure 4-32. DCXO Cicuit(SIM1)**

**\*SIM2-> Transceiver is embedded in BB chip.**

**Checking Flow**



Is the waveform of TP similar to Fig.7? — N0 → Replace X406/X502

Yes ↓

X-TAL Circuit is OK.
See next page to check PLL Circuit.

**Waveform**



TP1 (C406)
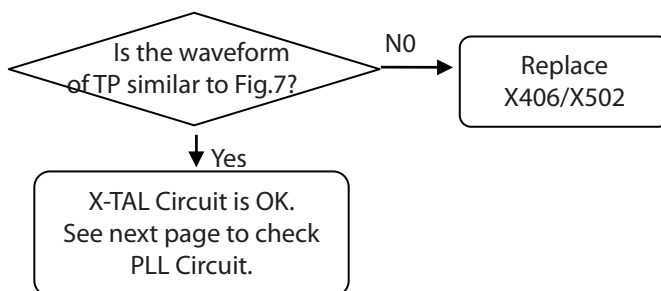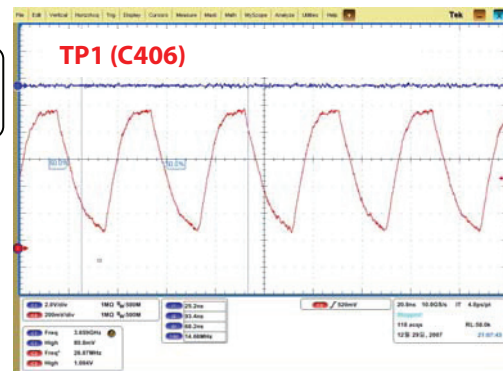
**Figure 4-33. DCXO Waveform**

## 4.12.2 Checking    PLL Control signals

**Checking Points**

**TP1 (RF_EN)**        **TP3 (RF_CLK)**



**TP2 (RF_DATA)**
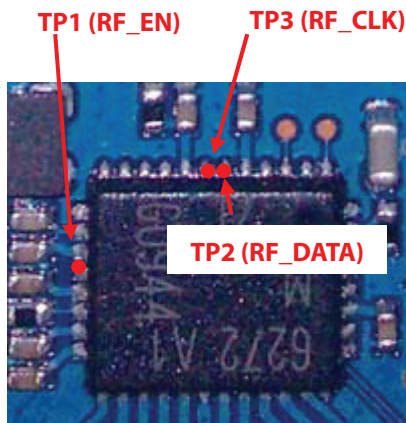
**Figure 4-34.    Transceiver**

**Checking Flow**



EN Signal(TP1) is OK ? — No → Check U401

Yes

DA(Data,TP2) is Normal ? — No → Check U401

Yes

CLK(Clock,TP3) is Normal ? — No → Check U401

Yes

Control Signal is OK.
See next page to check
Mobile SW & FEM.
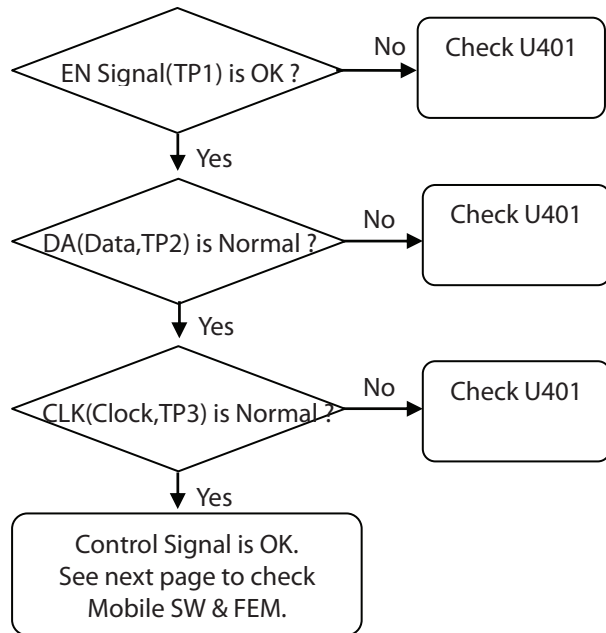
**RF Transceiver    Circuit Diagram**
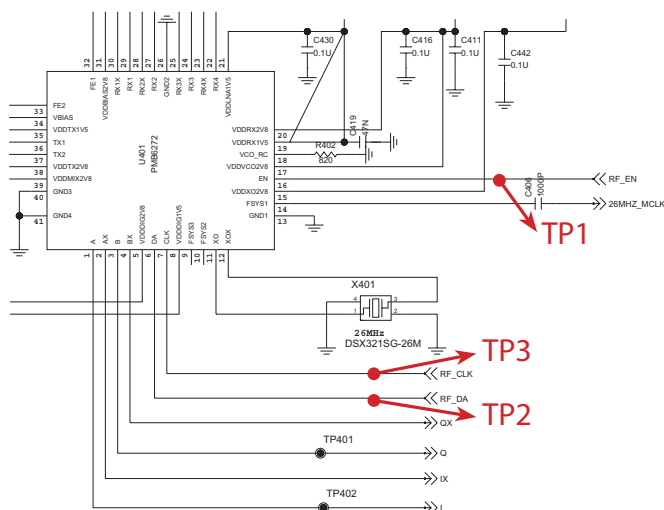


**Figure 4-35.    Transceiver Circuit**

**Waveform**



**RF_DATA(TP3)**

**RF_CLK(TP2)**

**RF_EN(TP1)**
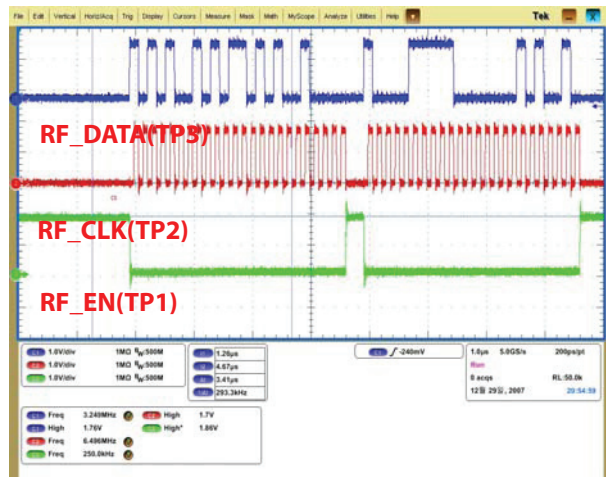
**Figure 4-36.    PLL Control Waveform**

***SIM2-> Transceiver is embedded in BB chip.**

## 4.12.3 Checking Mobile SW & FEM
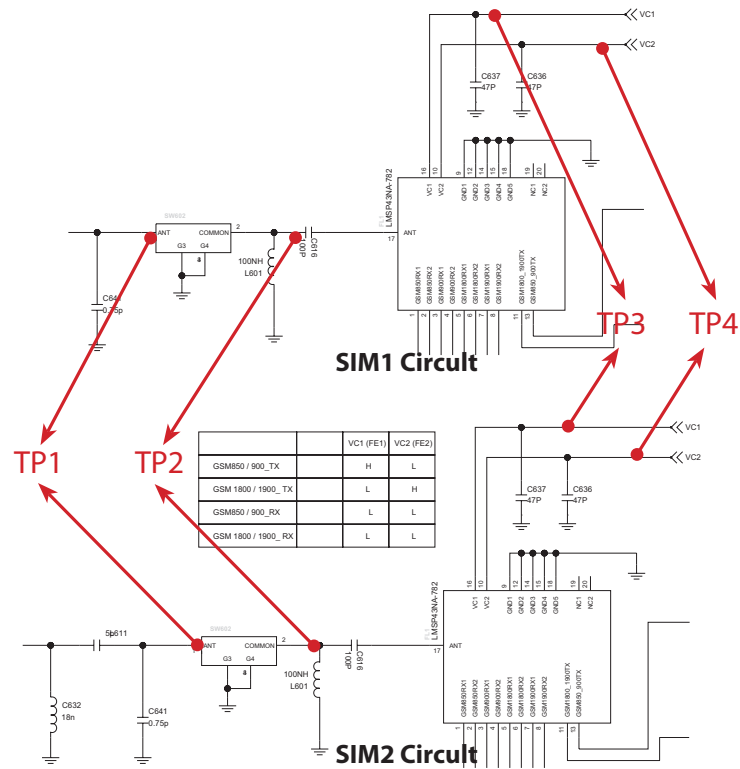


**Figure 4-37 Mobile SW & FEM Circuit**

| | | VC1 (FE1) | VC2 (FE2) |
|---|---|---|---|
| GSM850 / 900_TX | | H | |
| GSM 1800 / 1900_TX | | L | H |
| GSM850 / 900_RX | | L | L |
| GSM 1800 / 1900_RX | | L | L |



SIM1

SIM2
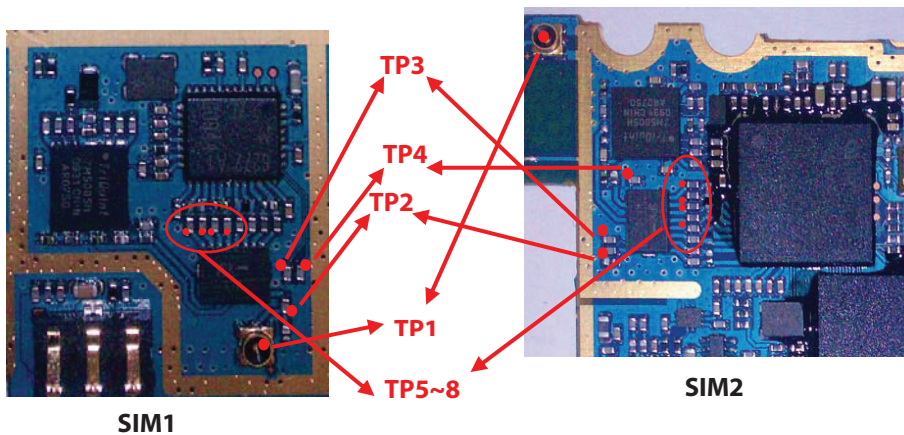
**Figure 4-38.    Mobile SW & FEM**

**Table 4-2. FEM RX Control Logic**

| | EGSM/GSM850 | DCS/PCS |
|---|---|---|
| FE1 | OFF | ON |
| FE2 | OFF | OFF |

# 4. TROUBLE SHOOTING

**Checking Flow**

Check TP1 of (SW401/SW602)
with RF Cable and TP2 of (C418/C616)

TP1 Signal same as
TP2? — No → Replace Mobile SW
(SW401/SW602)

Yes

Check TP3, TP4 of FL401/FL1 ?

Yes

Control Signal is
OK ? — No → Replace U101 / U503

Yes

TP5~8 Signal is
OK ? — No → Replace
FEM (FL401/FL1)

Yes

Mobile SW & FEM is OK.
Check Antenna.
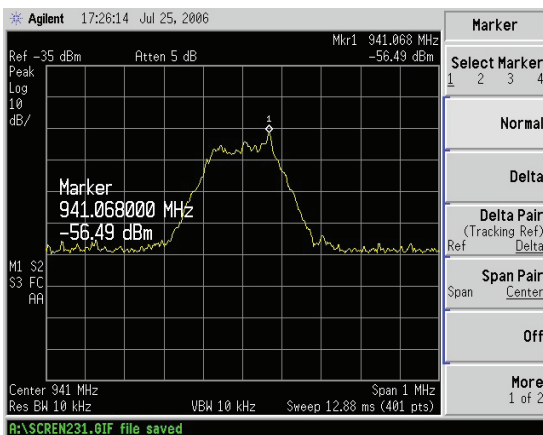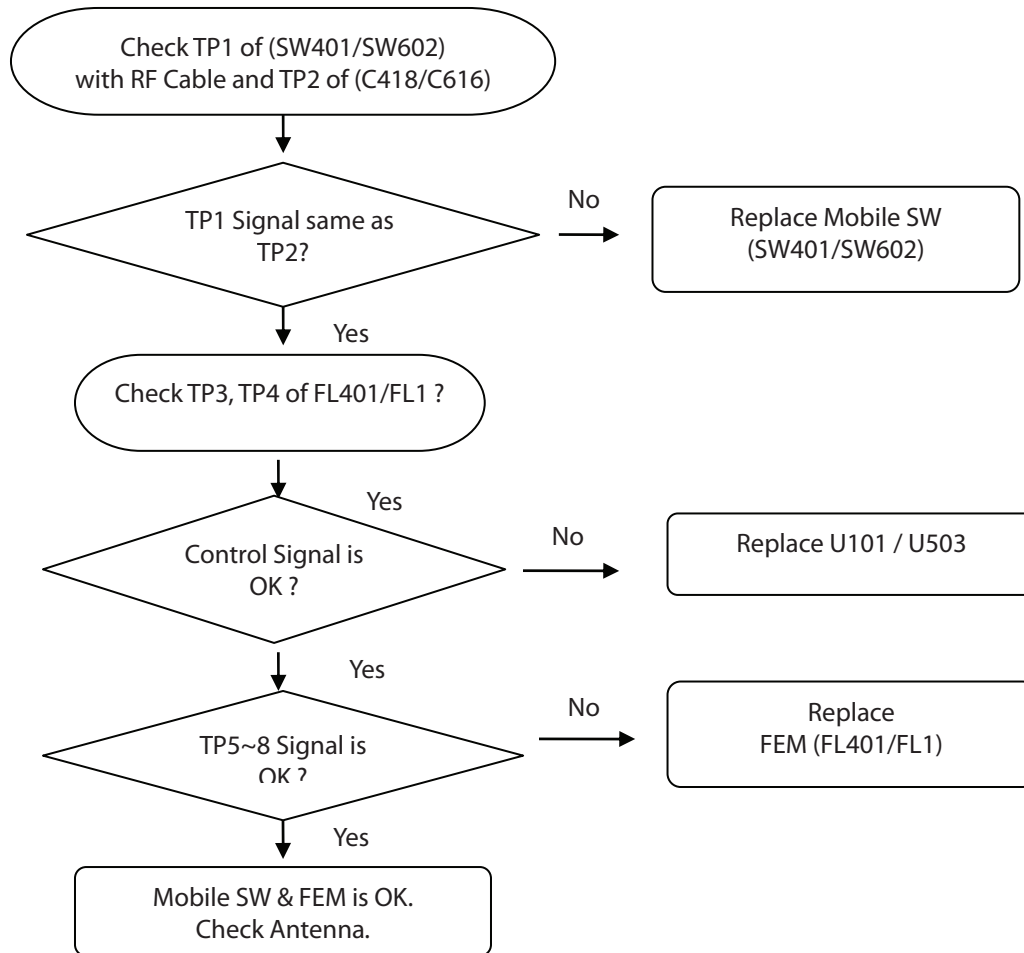


**Figure 4-39    Mobile SW (R403)**
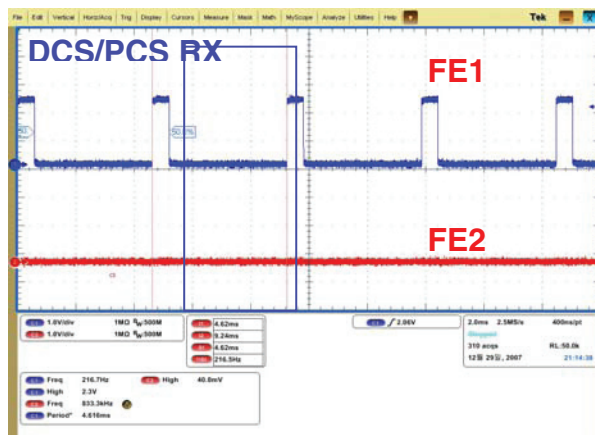


**Figure 4-40    FEM Control Signals**

## 4.12.4 Checking RX I/Q Signals



TP1(IX)
TP2(QX)
TP401(Q)
TP402(I)
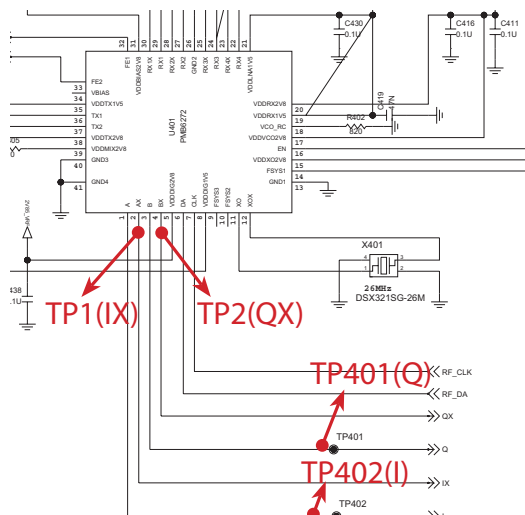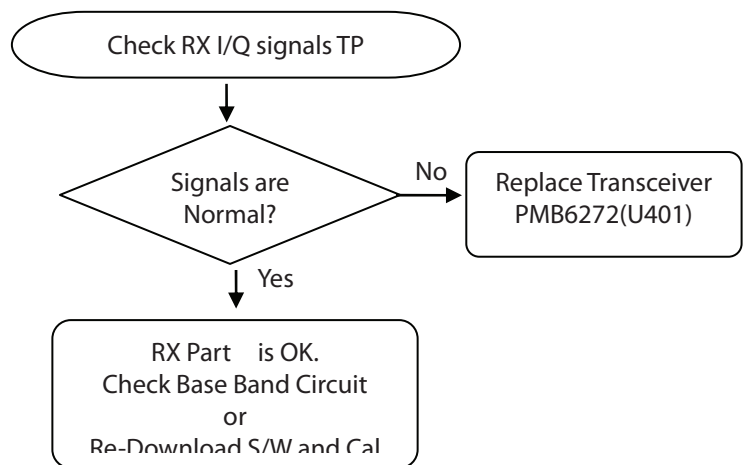
**Figure 4-41.  RX I/Q  Circuit**

**Checking Flow**

Check RX I/Q signals TP

Signals are Normal? — No → Replace Transceiver PMB6272(U401)

Yes

RX Part    is OK.
Check Base Band Circuit
or
Re-Download S/W and Cal

**Checking Points**



TP2(QX)
U401
TP402(I)
TP1(IX)
TP401(Q)

**Figure 4-42. RX I/Q**

**\*SIM2-> Transceiver is embeded in BB chip.**



I
Q

RX

I
Q

**Figure 4-43. RX I/Q Waveform**

## 4.13 Trouble shooting of Transmitter part

**Checking Points**

**Checking Points**

Setup Test Equipment
Cell Power : –74dBm
EGSM    CH30
DCS CH699

Check point ①
X-TAL

Check point ②
PLL Control

Check point ③
TX I/O Signal

Check point ④
Transceiver

Check point ⑤
PAM Control

Check ⑥
FEM & Mobile
SW

Re-Download S/W & RF CAL
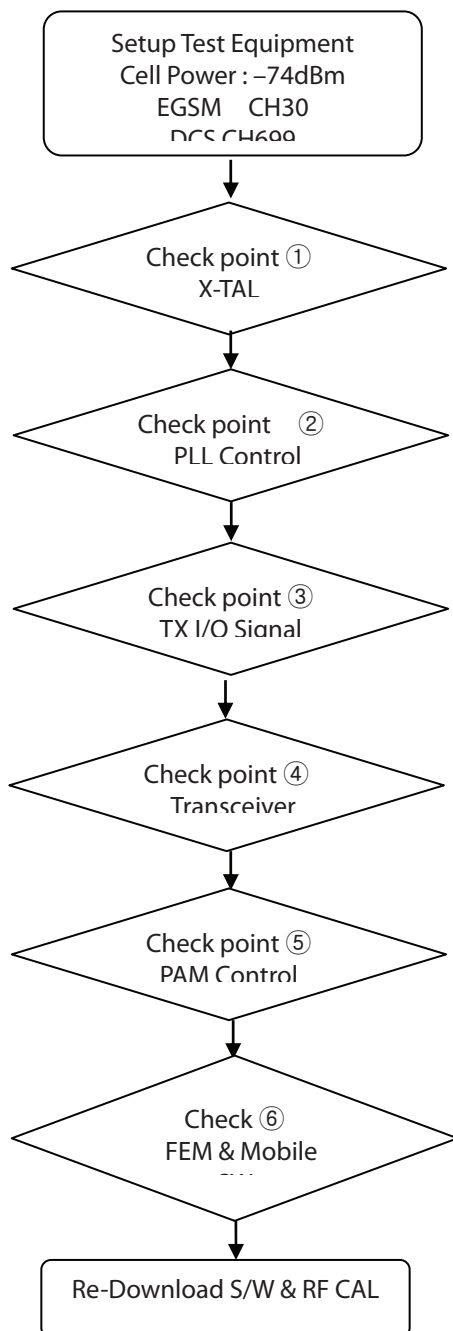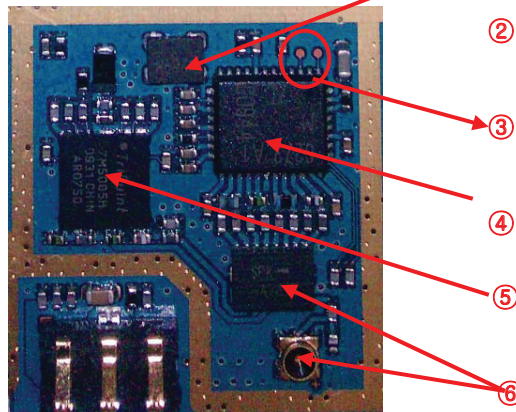
**Figure 4-44.    Main PCB**

**Figure 4-45.    Main PCB SIM2**
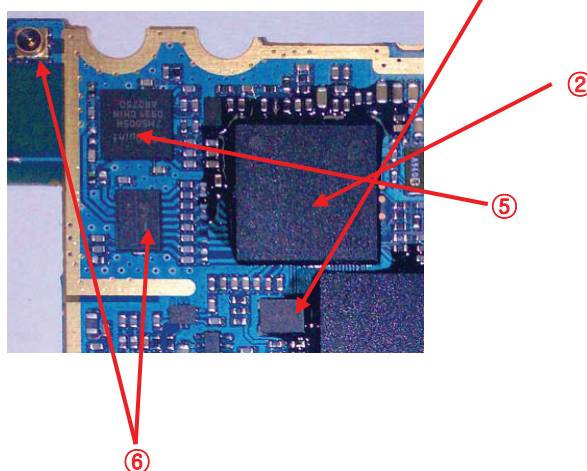
### 4.13.1 Checking VCTCXO Circuit
#### See RX Part "1. Checking DCXO Circuit"

### 4.13.2 Checking PLL Control Signal
#### See RX Part "2. Checking　PLL Control Signal"

## 4.13.3 Checking TX I/Q Signals



**Figure 4-46.   TX I/Q   Circuit**

**Checking Flow**

Check TX I/Q signals TP

Signals are Normal?

No → Replace Transceiver PMB6272(U401)

Yes

TX Part    is OK.
Check Base Band Circuit
or
Re-Download S/W and Cal

**Checking Points**
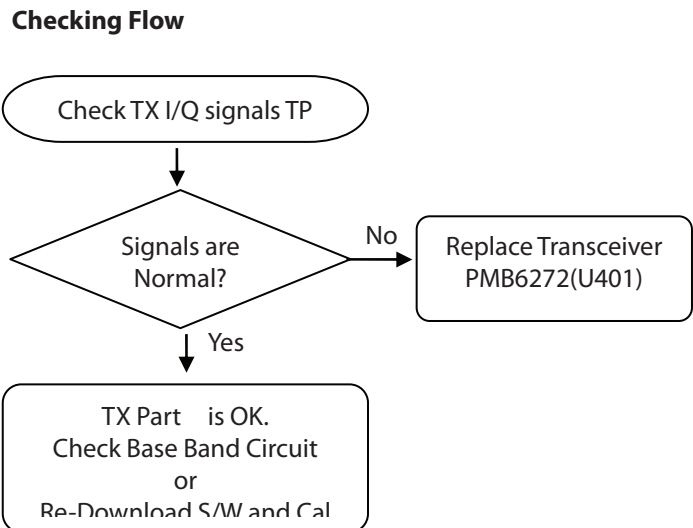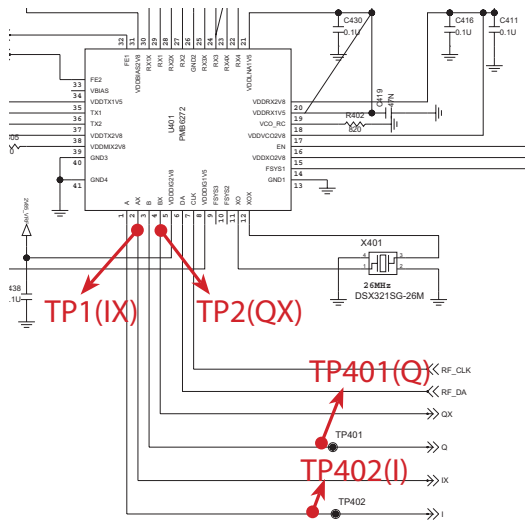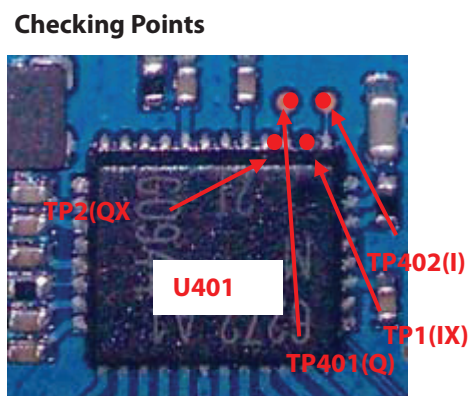


**Figure 4-47. TX I/Q**

*SIM2-> Transceiver is embeded in BB chip.
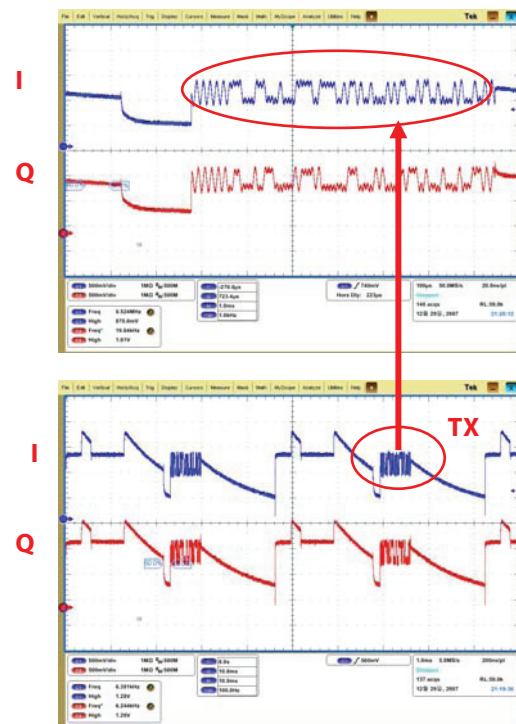


**Figure 4-48. TX I/Q Waveform**

## 4.13.4 Checking Transceiver Output Signals
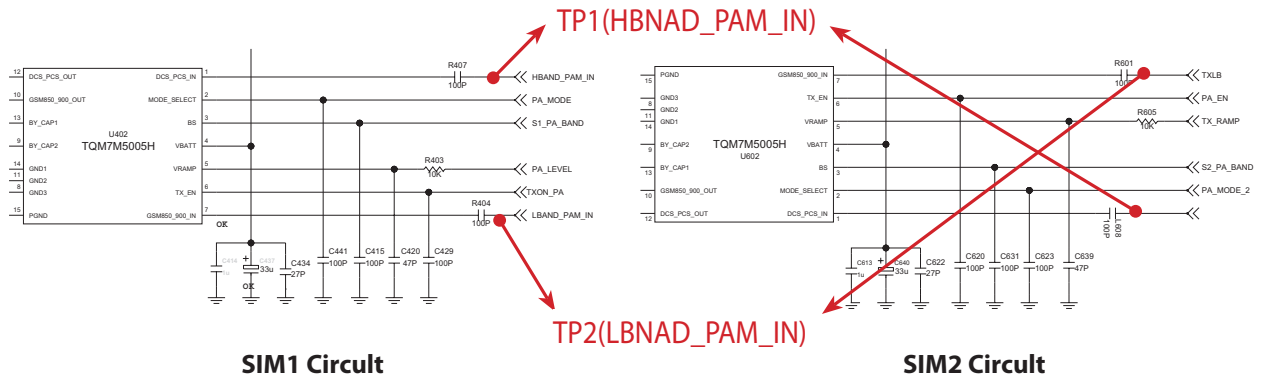


**Figure 4-49.    Transceiver Output Circuit**
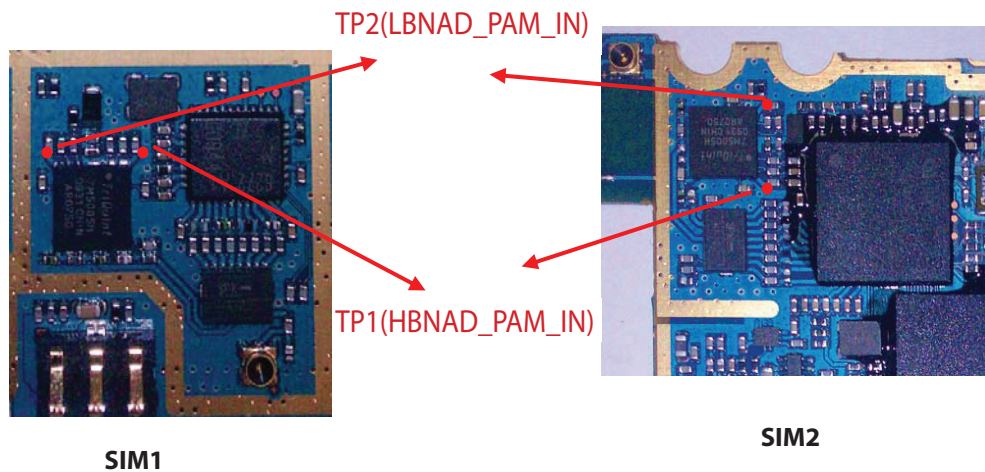


**Figure 4-50.    Transceiver Output**

**Table 4-3. Transceiver Output Operation**

| MODE | Transceiver Output |
|------|--------------------|
| GMSK | Fixed |
| 8PSK | Ramp Burst Control |

**Checking Flow**

Check Output Signal
(TP1, TP2)

Signals are
Normal ?

No → Replace
PMB6272(U401/U50

Yes

Transceiver is OK.
See next page to check
PAM Control Circuit.
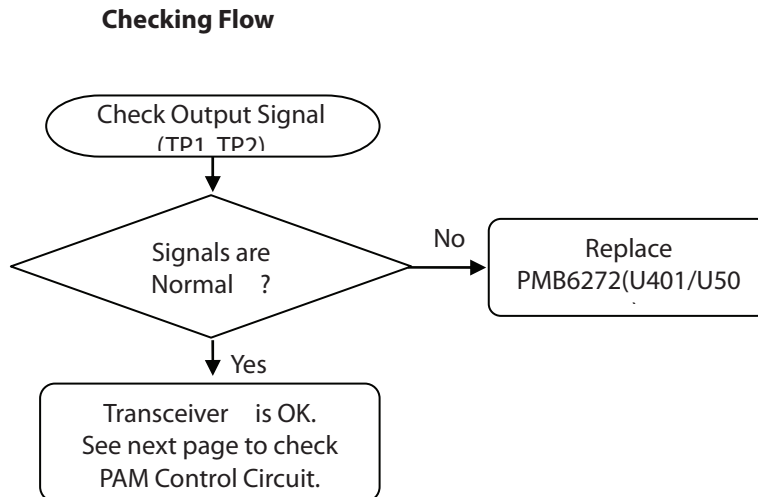
**LBAND_PAM_IN (MODE: GMSK) : TP2**
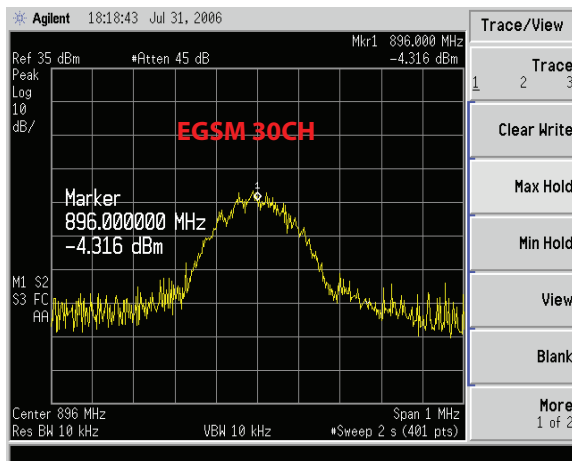


**Figure 4-51. Transceiver Output (GMSK)**

**LBAND_PAM_IN (MODE: 8PSK) : TP2**
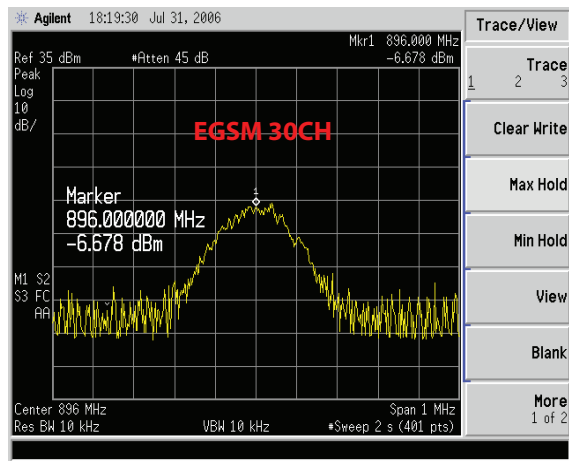


**Figure 4-52. Transceiver Output (8PSK)**

## 4.13.5 Checking PAM Control Signals
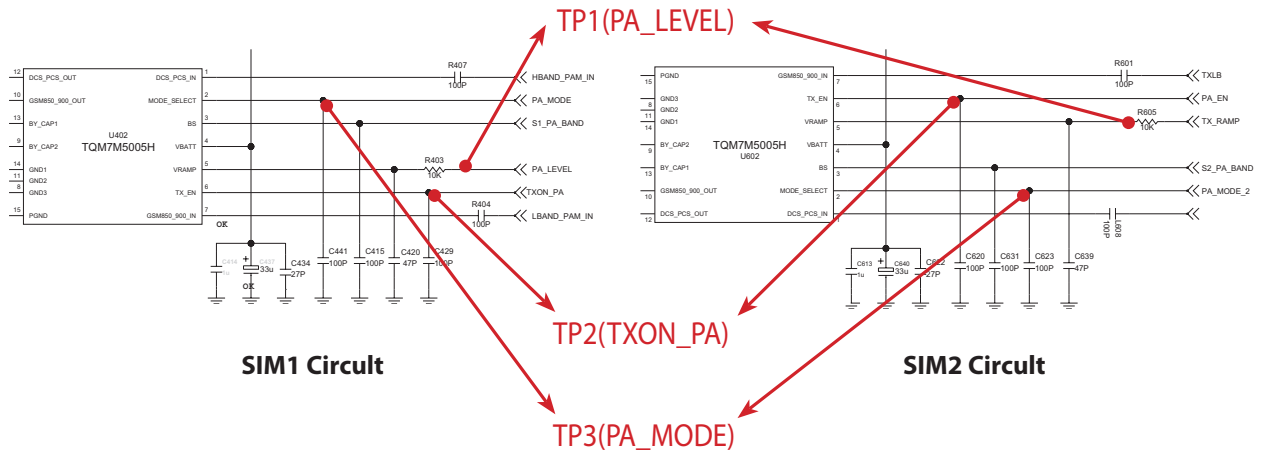


**Figure 4-53.    PAM Control Signals Circuit**



**SIM1**

**SIM2**
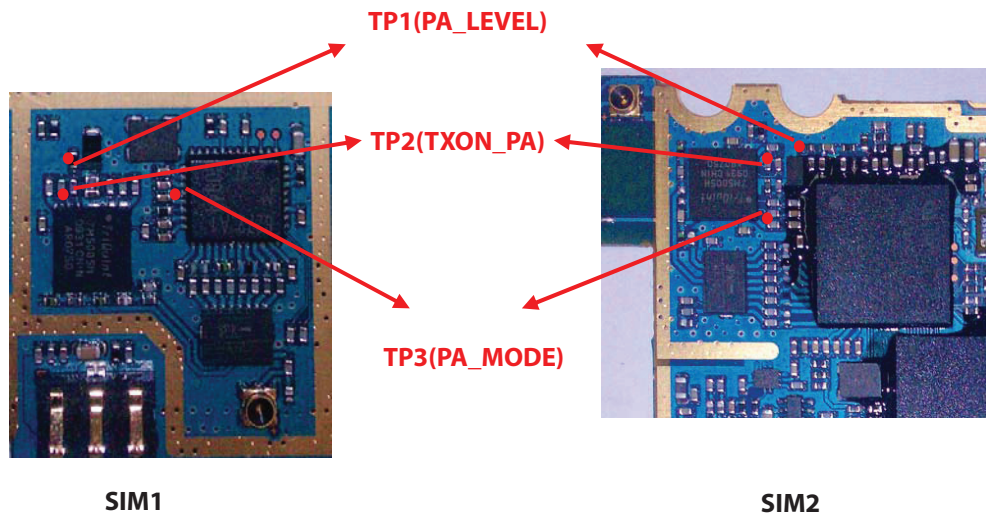
**Figure 4-54.    PAM Output**

**Table 4-4. PAM Mode Operation**

| MODE | MODE | PA_LEVEL | TXON_PA |
|------|------|----------|---------|
| GMSK | LOW | Ramp Burst Control | HIGH |
| 8PSK | HIGH | Control Amp bias | HIGH |

**Checking Flow**

```
        ┌─────────────────────────┐
        │  Check Control Signals  │
        │    (TP1, TP2, TP3)      │
        └─────────────────────────┘
                    │
                    ▼
              ╱───────────╲              ┌──────────────────┐
             ╱  Signals are ╲    No      │      Check       │
             ╲   Normal  ?  ╱ ─────────▶ │  PMB8877/PMB8888 │
              ╲───────────╱              │   (U101/U502)    │
                    │                    └──────────────────┘
                    ▼ Yes
        ┌─────────────────────────┐
        │ PAM Control Signal is OK.│
        │  See next page to check │
        │  FEM & Mobile SW Circuit.│
        └─────────────────────────┘
```
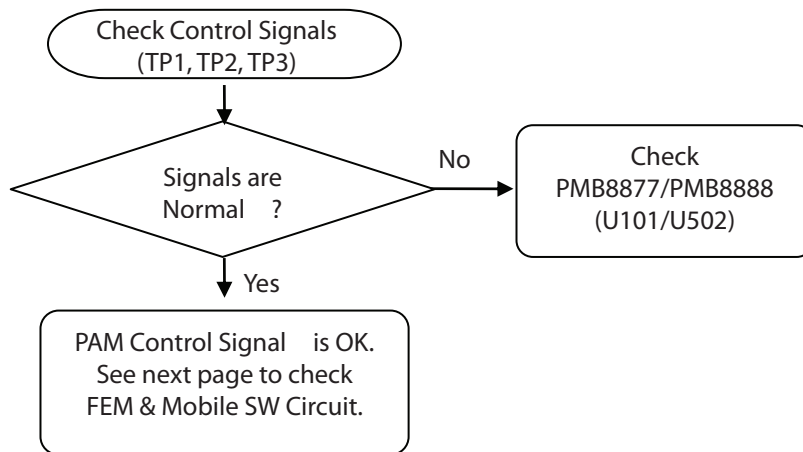
**Figure 4-55.  GSMK Control Signal**
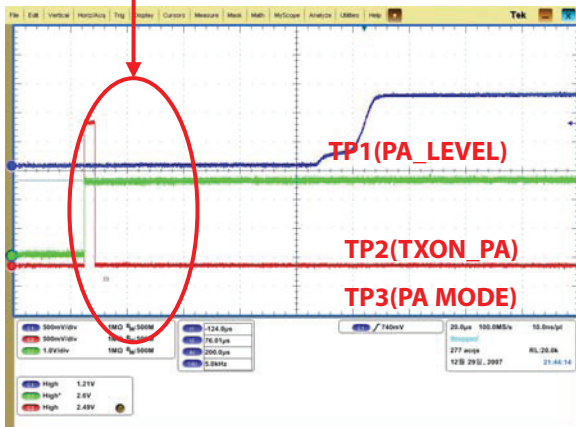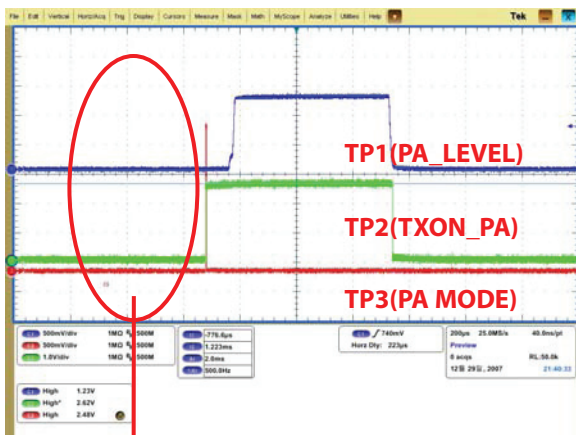


**Figure 4-56.  8PSK Control Signal**
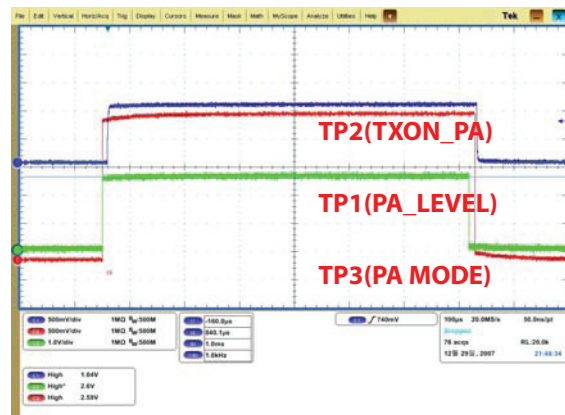


TP3(PA MODE) : R441/R623
TP1(PA_LEVEL) : R403/R605
TP2(TXON_PA) : R429/R620

## 4.13.6 Checking FEM & Mobile SW

**Mobile SW & FEM Circuit**
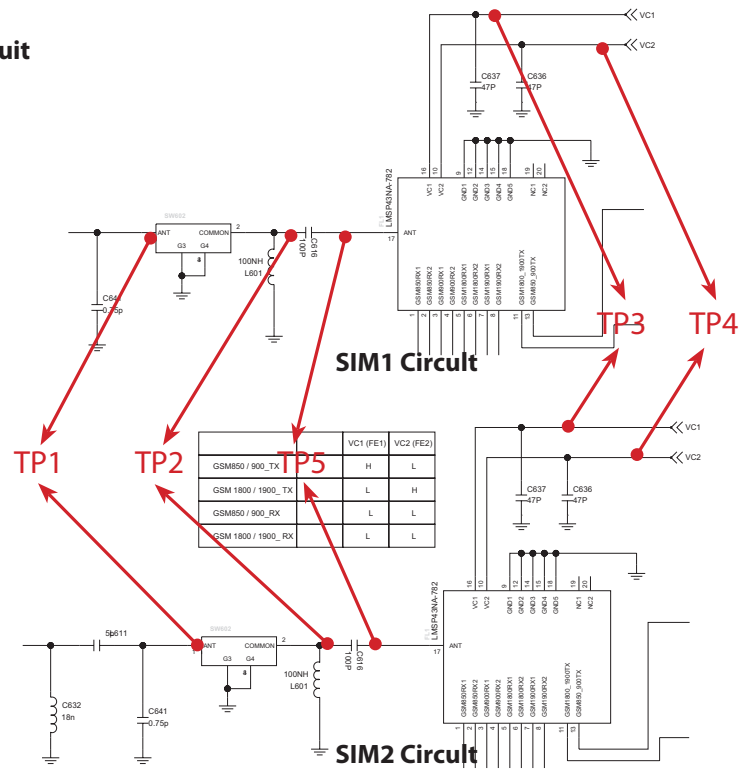


**Figure 4-57. Mobile SW & FEM Circuit**



**SIM1**

**SIM2**
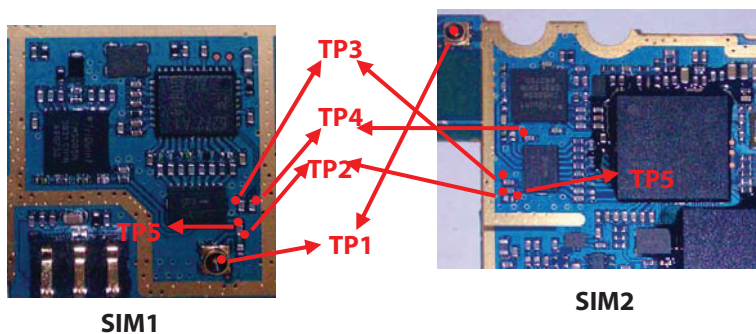
**Figure 4-58.     Mobile SW & FEM**

**Table 4-5. FEM TX Control Logic**

|     | EGSM/GSM850 | DCS/PCS |
|-----|-------------|---------|
| FE1 | OFF | ON |
| FE2 | ON | ON |

# 4. TROUBLE SHOOTING

**Checking Flow**

Check TP1 of SW600 with RF Cable and TP2 of C418/C616

TP1 Signal same as TP2? — No → Replace Mobile SW (SW401/SW602)

Yes ↓

Check TP3, TP4 of FL401/FL1 ?

Control Signal is OK ? — No → Replace BB CHIP (U101/U502)

Yes ↓

TP5 Signal is OK ? — No → Replace FEM (FL401/FL1)

Yes ↓

Mobile SW & FEM is OK. Check Antenna.
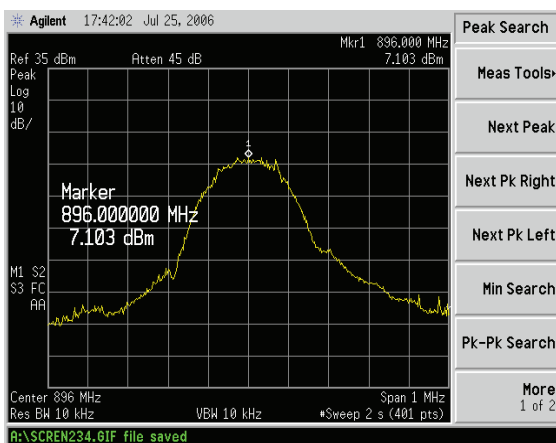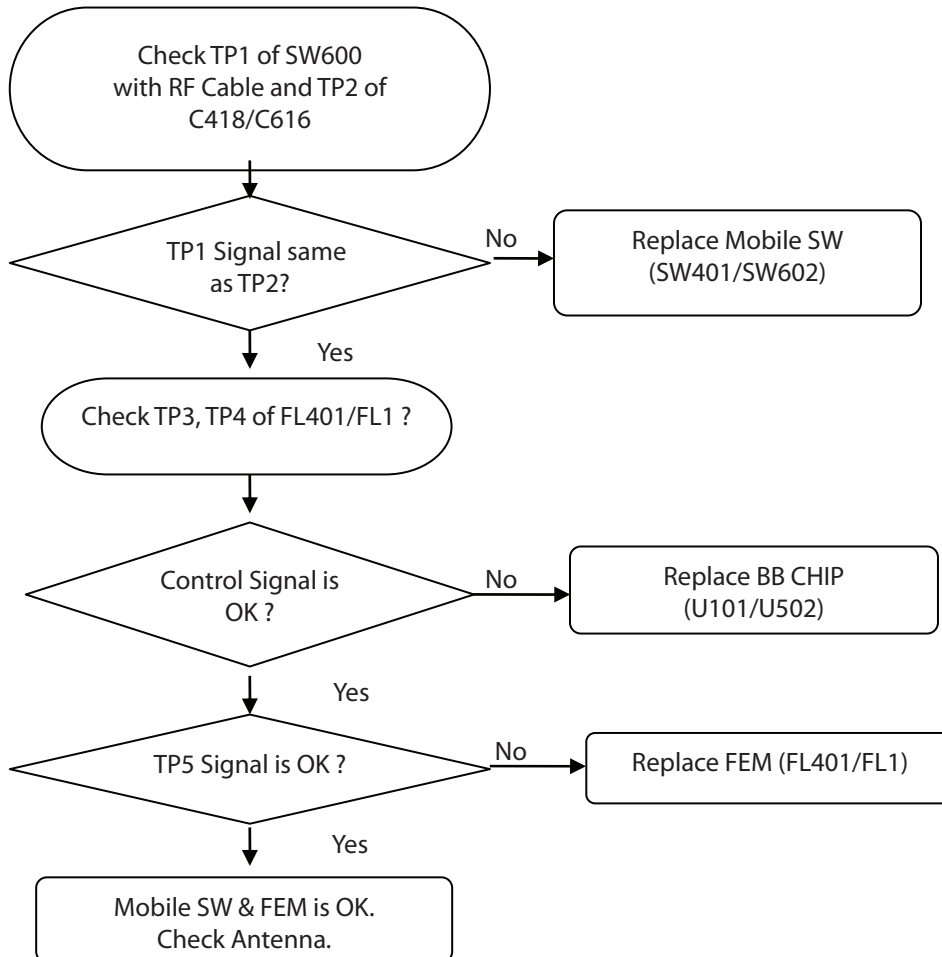


**Figure 4-59  Mobile SW (R403)**
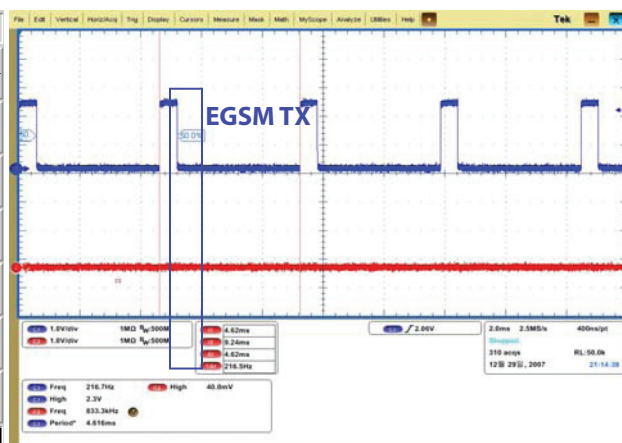
**Figure 4-60  FEM Control Signals**

## 4.14 Trouble shooting of WI-FI/BT/FM part

**Checking Flow**

**Checking Points**

```
┌─────────────────────────┐
│   Setup Test Equipment   │
│                          │
│          START           │
└─────────────────────────┘
            │
            ▼
       ╱─────────╲
      ╱ Check point ①╲
      ╲    Clock    ╱
       ╲─────────╱
            │
            ▼
       ╱─────────╲
      ╱ Check point ②╲
      ╲   POWER     ╱
       ╲─────────╱
            │
            ▼
       ╱─────────╲
      ╱ Check point ③╲
      ╲   Module    ╱
       ╲─────────╱
            │
            ▼
┌─────────────────────────┐
│    Compoment Change      │
│                          │
│           END            │
└─────────────────────────┘
```
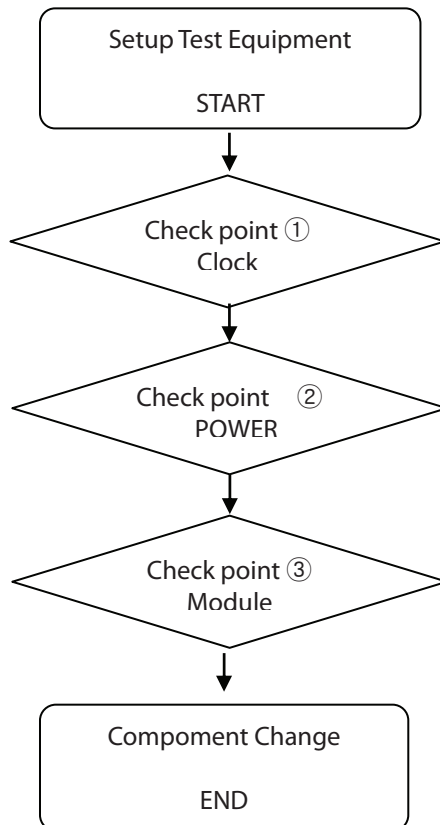
**Figure 4-61.    WI-FI/BT/FM Module**
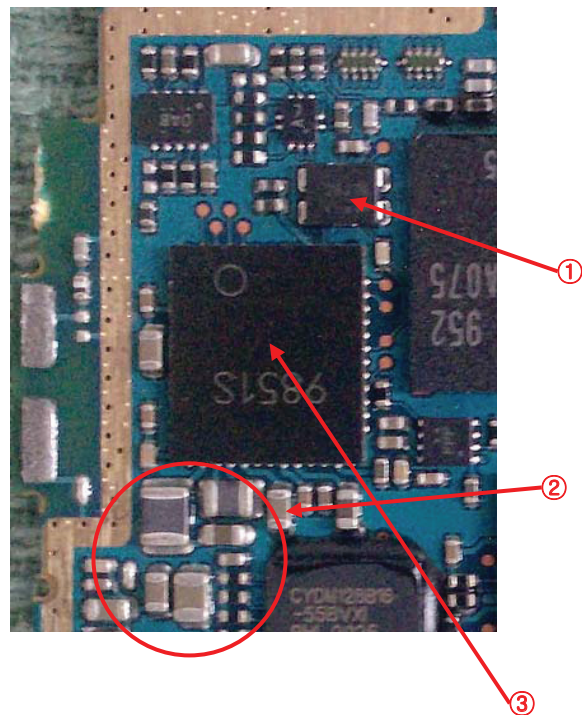
# 4. TROUBLE SHOOTING

## 4.14.1 Checking Main Clock part

**Checking Points**



TP2(26MHz)C645

TP1 (CLK_REQ)R606

**Checking Flow**

START

(TP1,2) is OK ? — No → Check TCXO

Yes
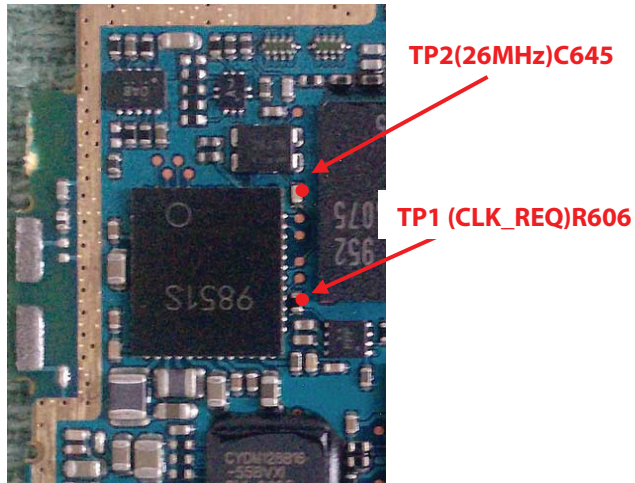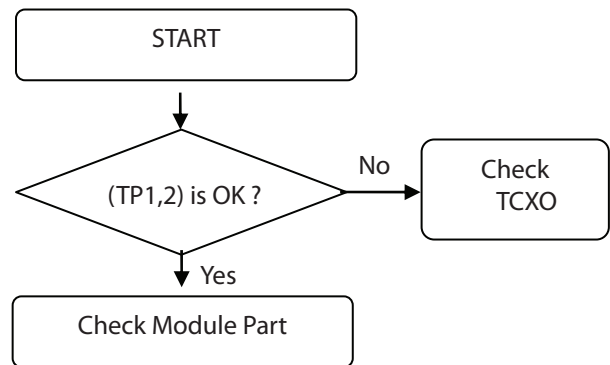
Check Module Part

**Figure 4-62.   WI-FI/BT/FM Clock part**

## LDO for TCXO



## 26MHz TCXO

TP1 (CLK_REQ)

TP2 (26MHz)
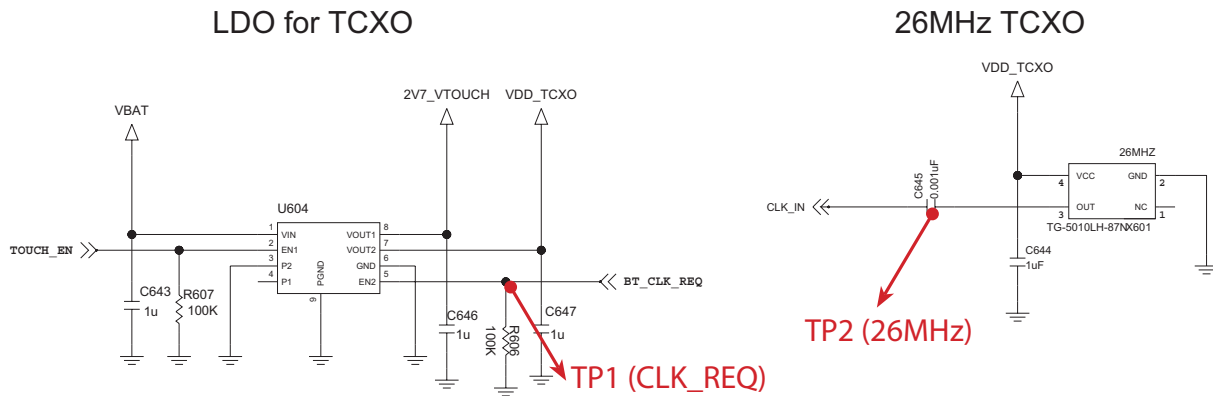
**Figure 4-63. WI-FI/BT/FM Clock Circuit**

## 4.14.2 Checking MODULE part

**Checking Points**
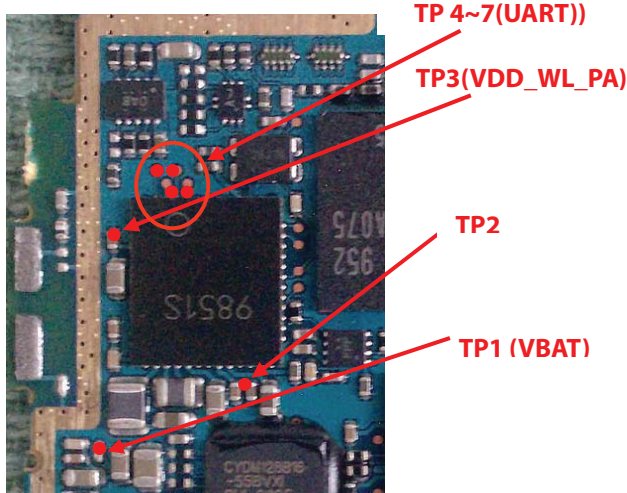
**Checking Flow**
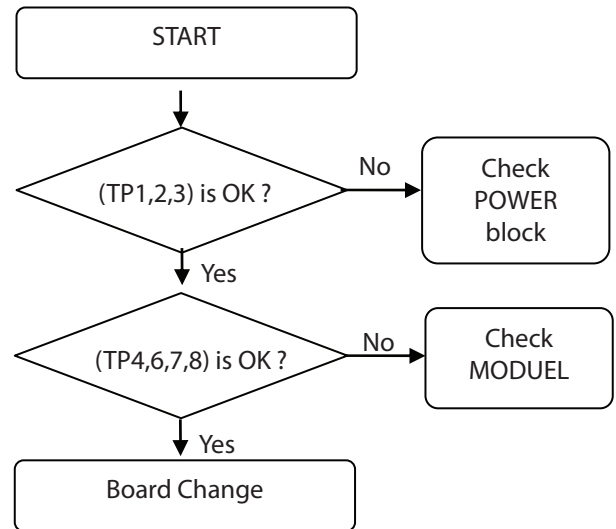


Figure 4-64.    **WI-FI/BT/FM MODULE**

WLAN+BT+FM



TP1(VBAT)

TP3(VDD_WL_PA)
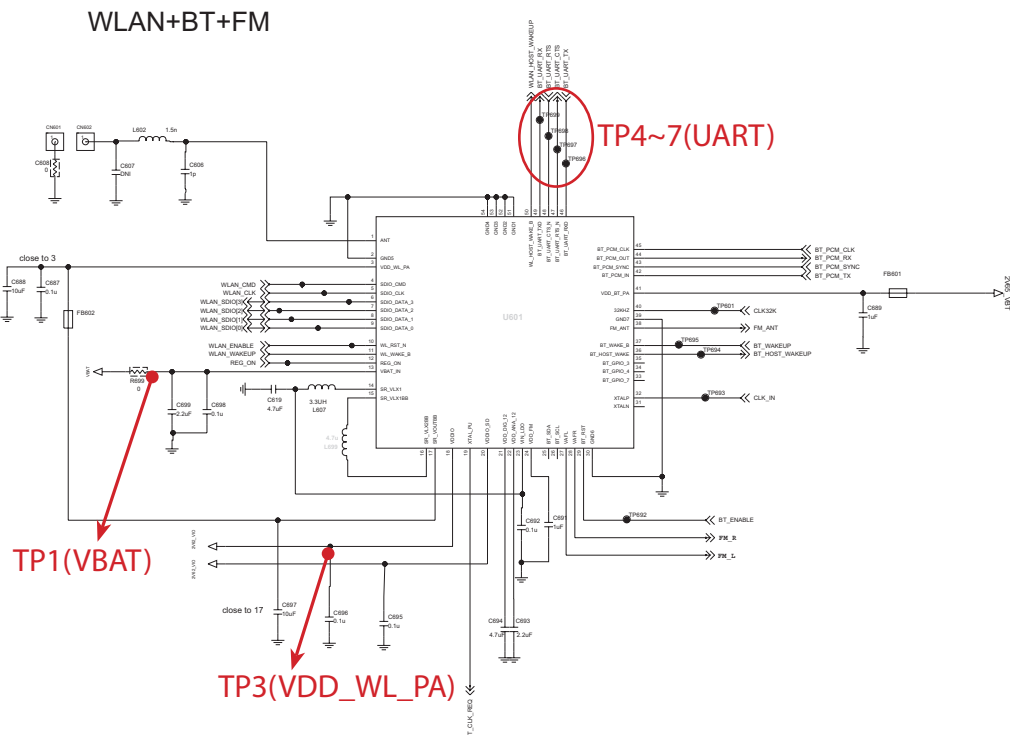
**Figure 4-65. WI-FI/BT/FM MODULE Circuit**

# 5. DOWNLOAD & S/W UPGRADE

1.  Run "Setup.exe" for Installation Infineon usb driver.
2.  Click Install button.
3.  Click Exit button after installation completion.

"Phone and I/O Cable" Connect
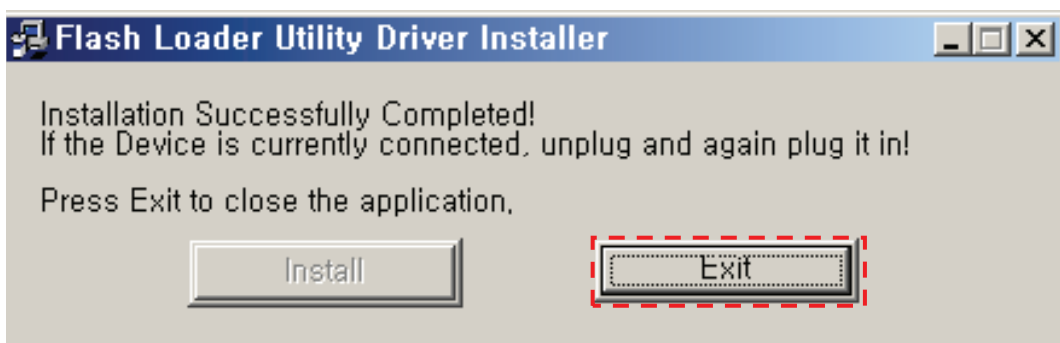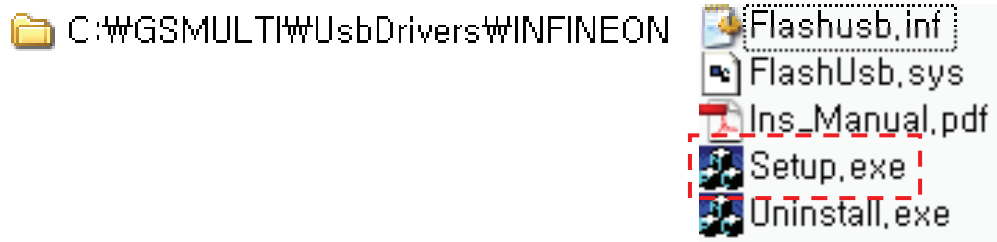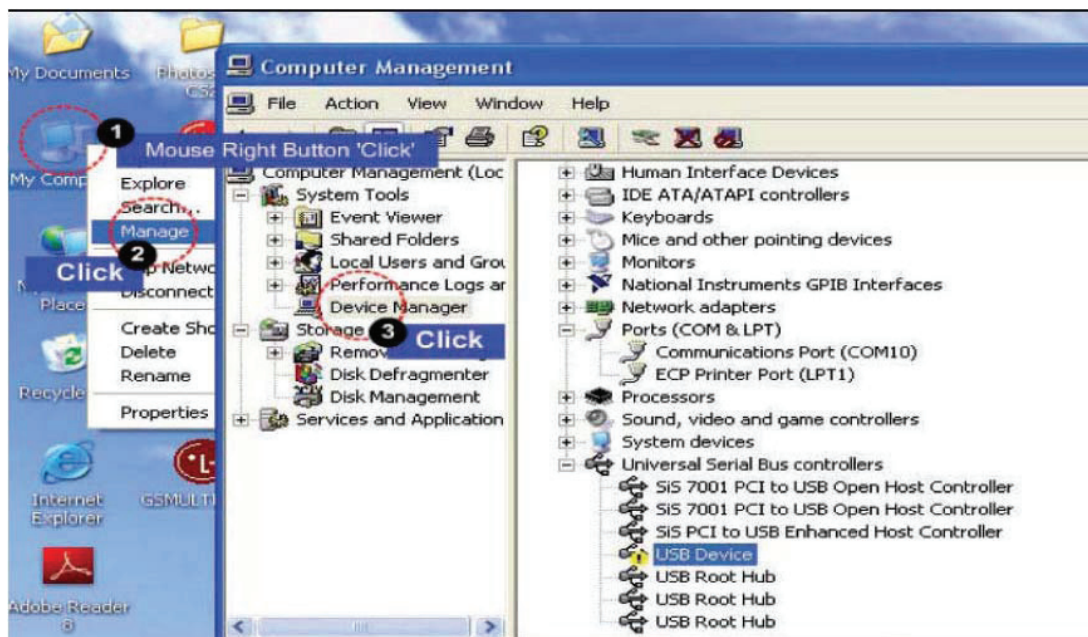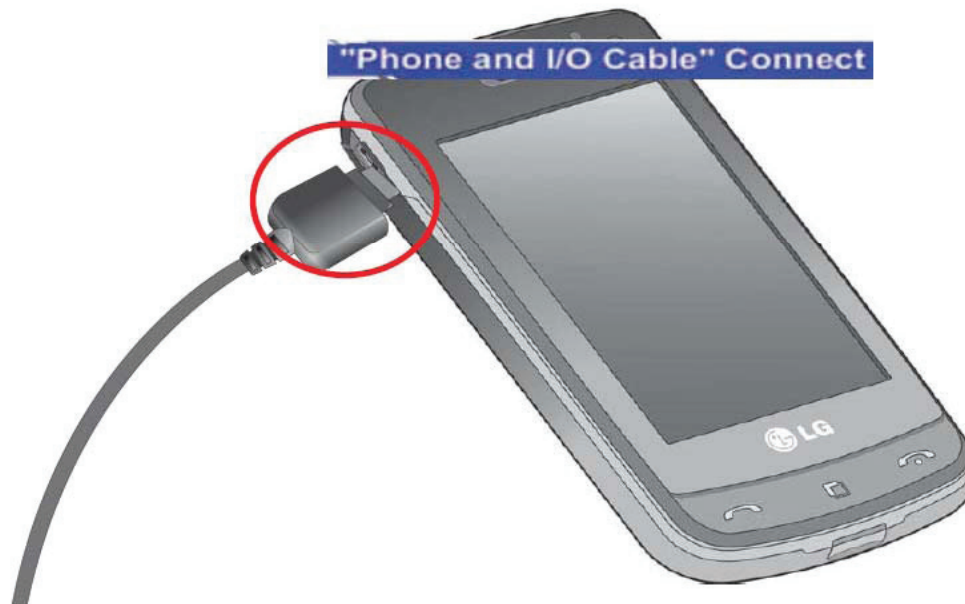
# 5. DOWNLOAD & S/W UPGRADE

1.  Connect cable within the device.
2.  Windows will pop-up Found new hardware wizard and detect the new usb device.
3.  Check "Install the software automatically (Recommended)" button,
    install driver for the device. (or set specific location.)
4.  In case of Infineon, "Flash Loader utility" will be installed.
5.  If you have several usb ports for usb download, you have to repeat
    installation from No. 1 to No. 3 for each the usb port.

Eg. In case of Infineon, "Flash Loader utility" will be installed as shown below.
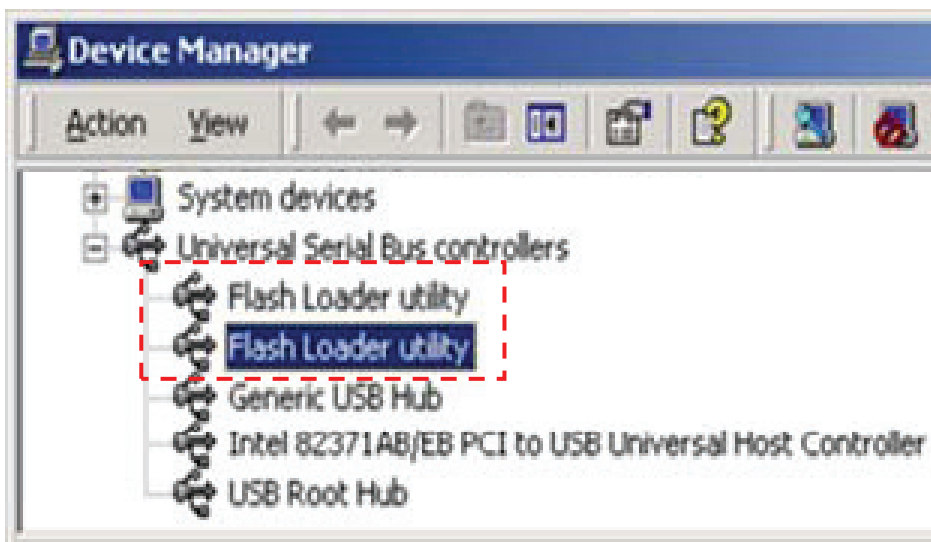
1.  Run USB Map Program and check solution, click mapping start.
2.  Connect the usb or nexus cable with the device in order of port number.
3.  If you have the disable port, click "SKIP" button.
4.  After mapping is completed, click "Save & Exit" button.





Connection in 1st port

Connection in 2nd port

Skip 3rd port

# 5. DOWNLOAD & S/W UPGRADE

"Phone and I/O Cable" Connect



LG-GSM Multi Download [Ver 3.0]

File(F)  Setting(S)  About(H)

START   Model :   GX500   SW Version : H  GX500   208-01

COM 1

Transmission amount
[BIN] 2%   4 s

Start Download
Start boot process.
Device synchronized.
Boot-loader is active       <<< When it's execution-screen.
EBL version: NOT RELEASED 65535..65535
Boot mode is: DD
Using: Faster CRC, Writing all blocks , Skip data CF
Package length is 16384
Baud rate set to 921600
Get flash id.
Flash ID is: 00000000
Boot process finished
Sending sec-pack.
Load region 0
Sending data.

# 6. BLOCK DIAGRAM

# 7. CIRCUIT DIAGRAM
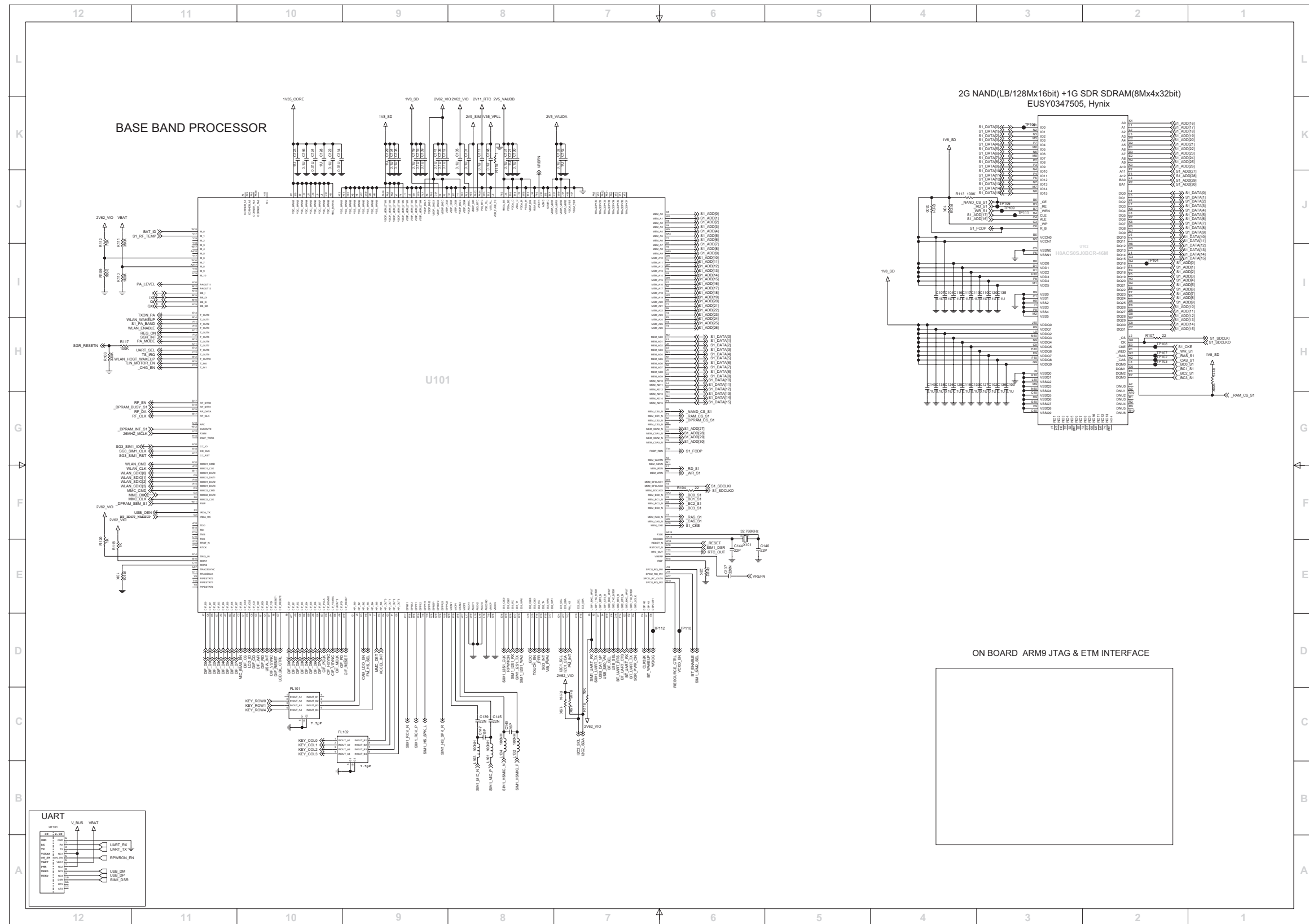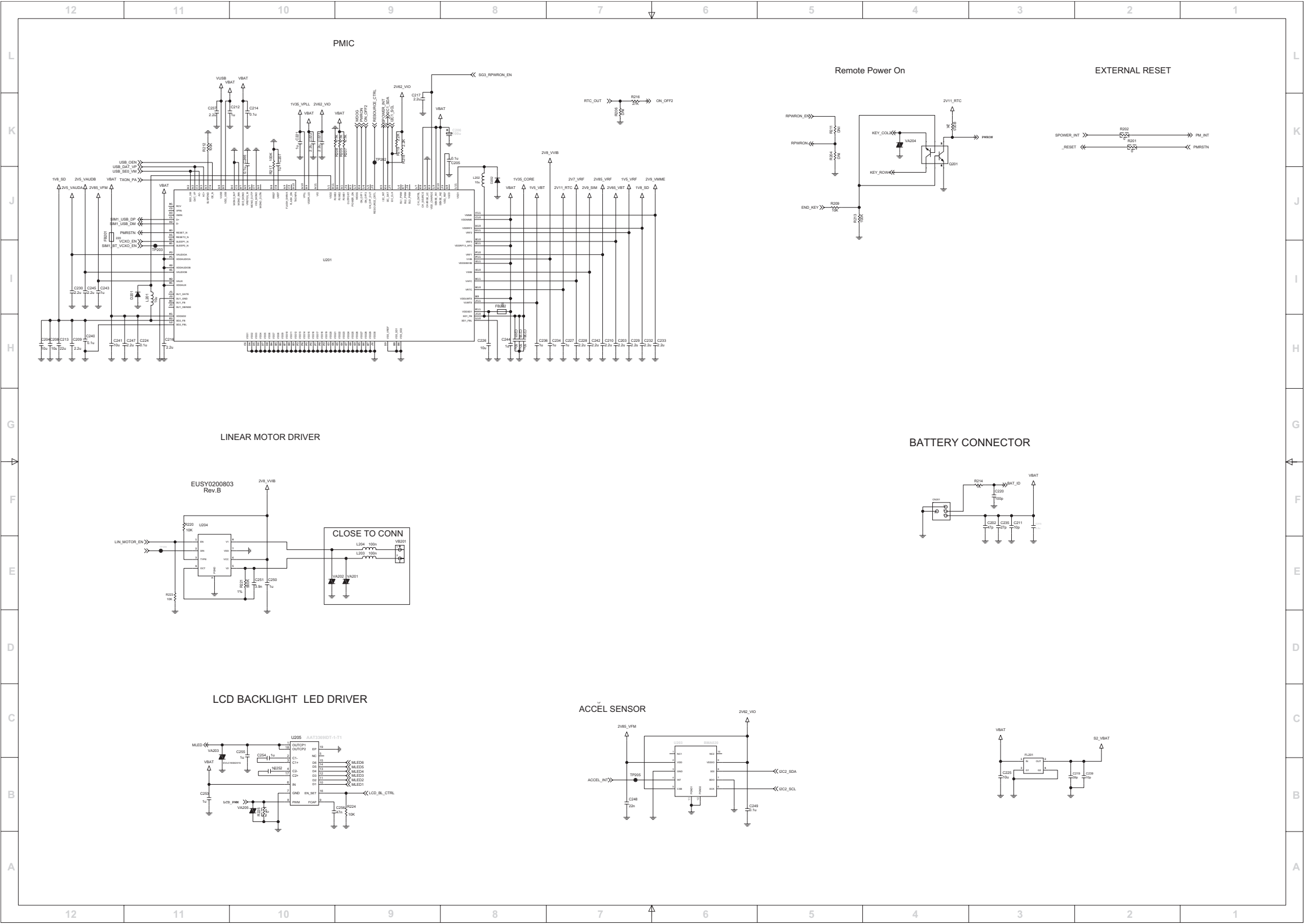
BASE BAND PROCESSOR

2G NAND(LB/128Mx16bit) +1G SDR SDRAM(8Mx4x32bit)
EUSY0347505, Hynix

U101

ON BOARD ARM9 JTAG & ETM INTERFACE

UART

# 7. CIRCUIT DIAGRAM

# 7. CIRCUIT DIAGRAM

# 7. CIRCUIT DIAGRAM

# 7. CIRCUIT DIAGRAM

1G NAND(LB/64Mx16bit) +512M SDR SDRAM(8Mx4x16bit)
EUSY0389001, SS

U503

U502

EXT_RESET

ON BOARD  ARM9 JTAG & ETM INTERFACE

# 7. CIRCUIT DIAGRAM

WLAN+BT+FM

LDO for TCXO

26MHz TCXO

# 7. CIRCUIT DIAGRAM

128K DUAL PORT STATIC RAM
EUSY0285602, CYPRESS

AUDIO AMP SUB SYSTEM

SPK
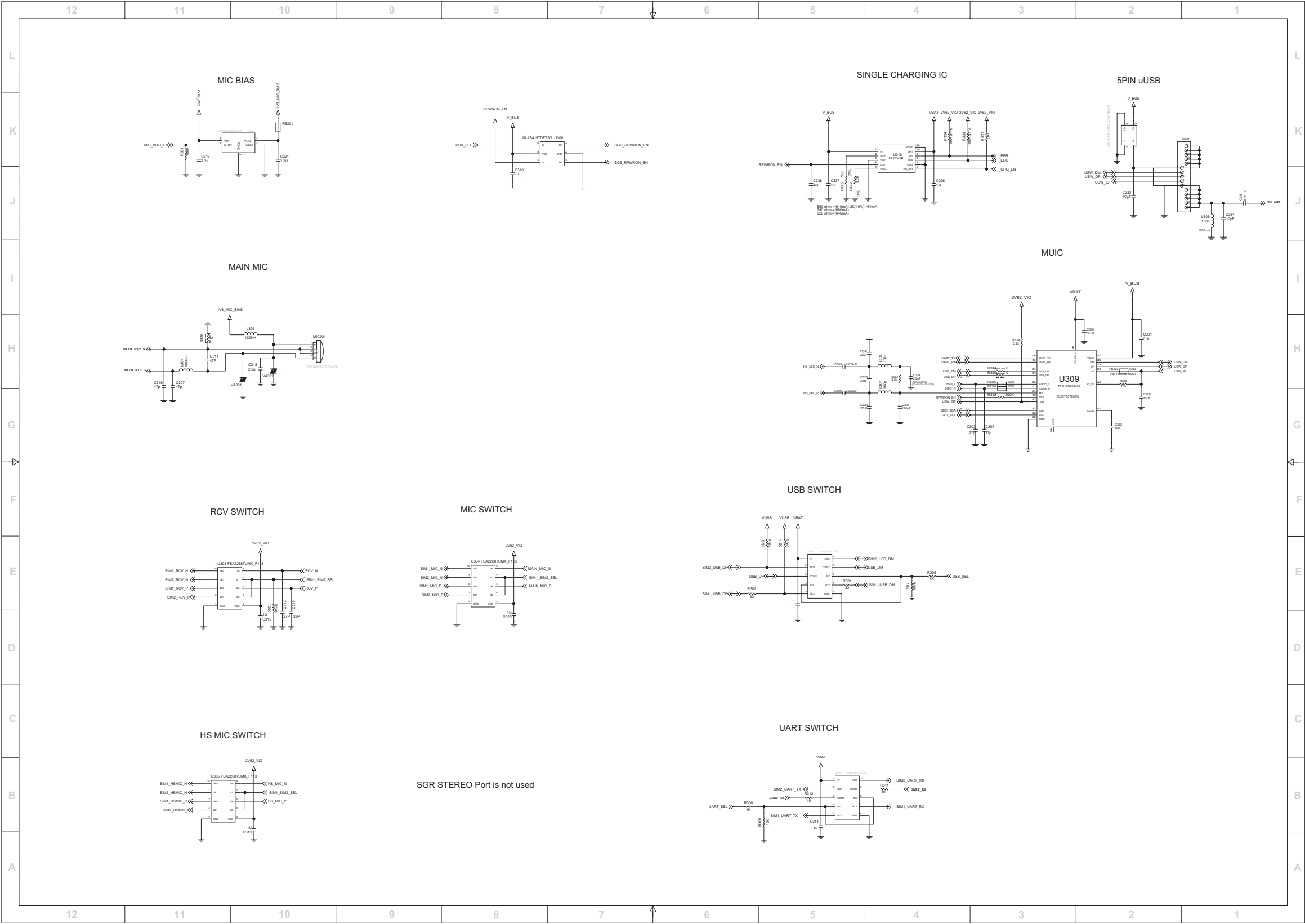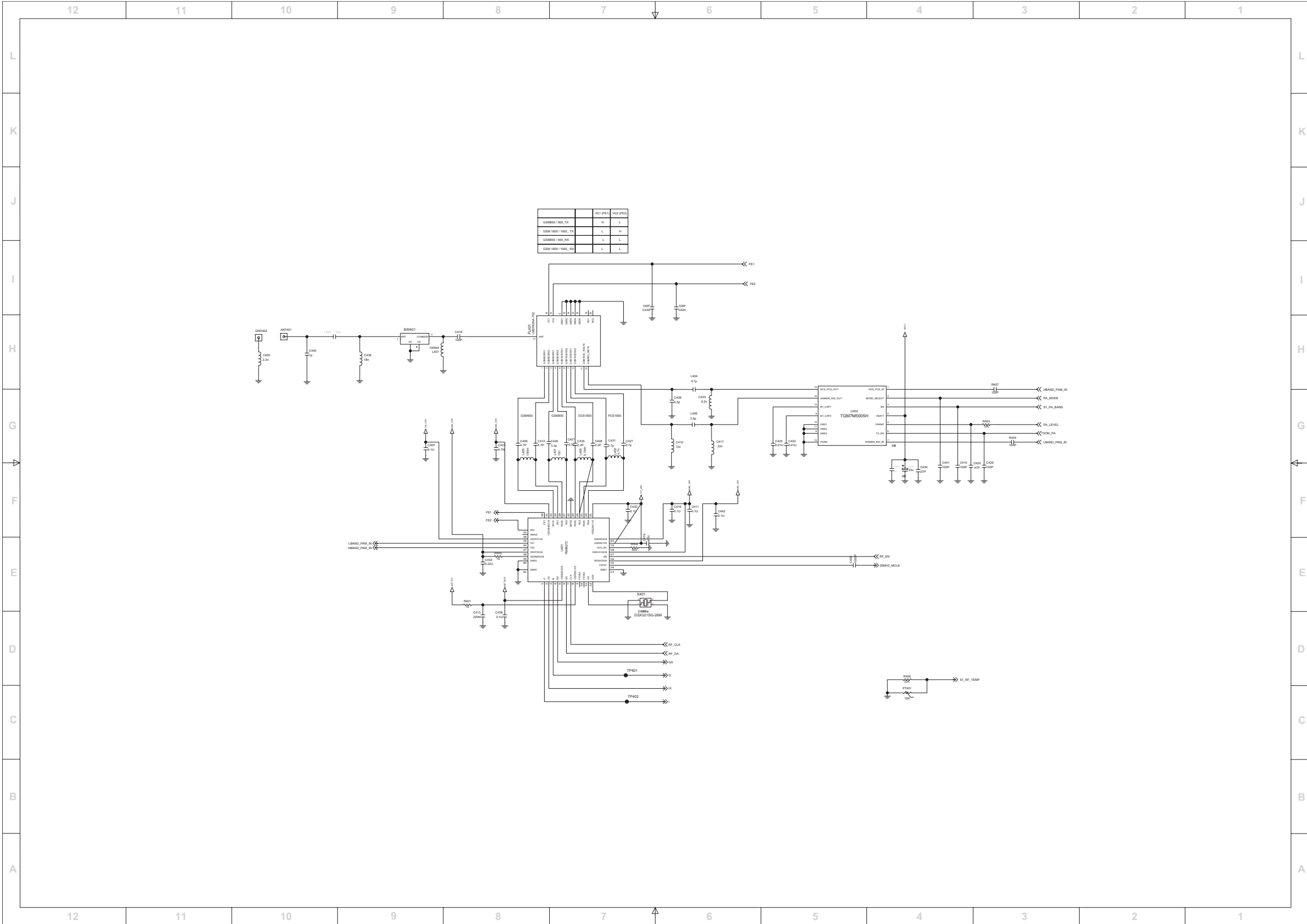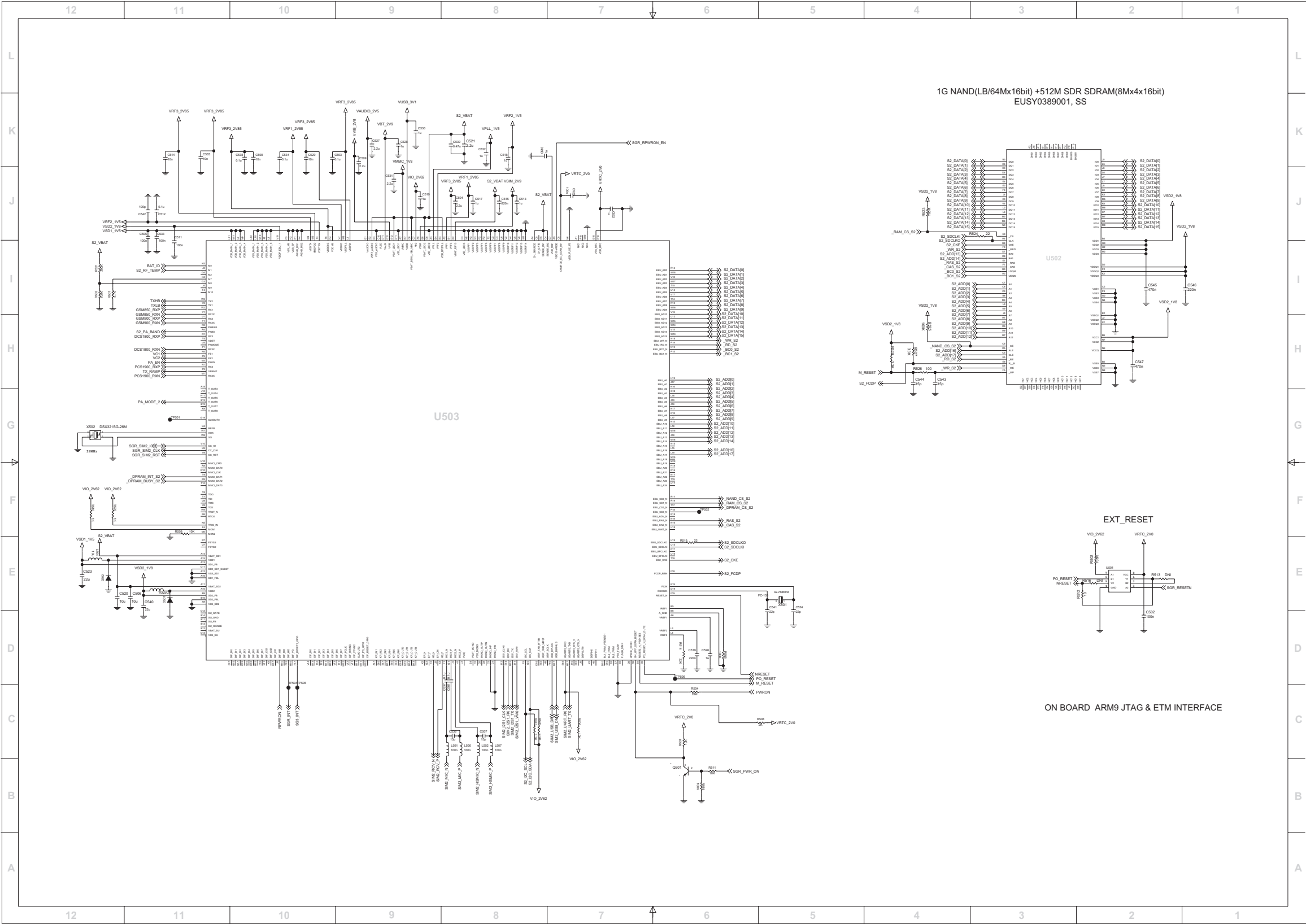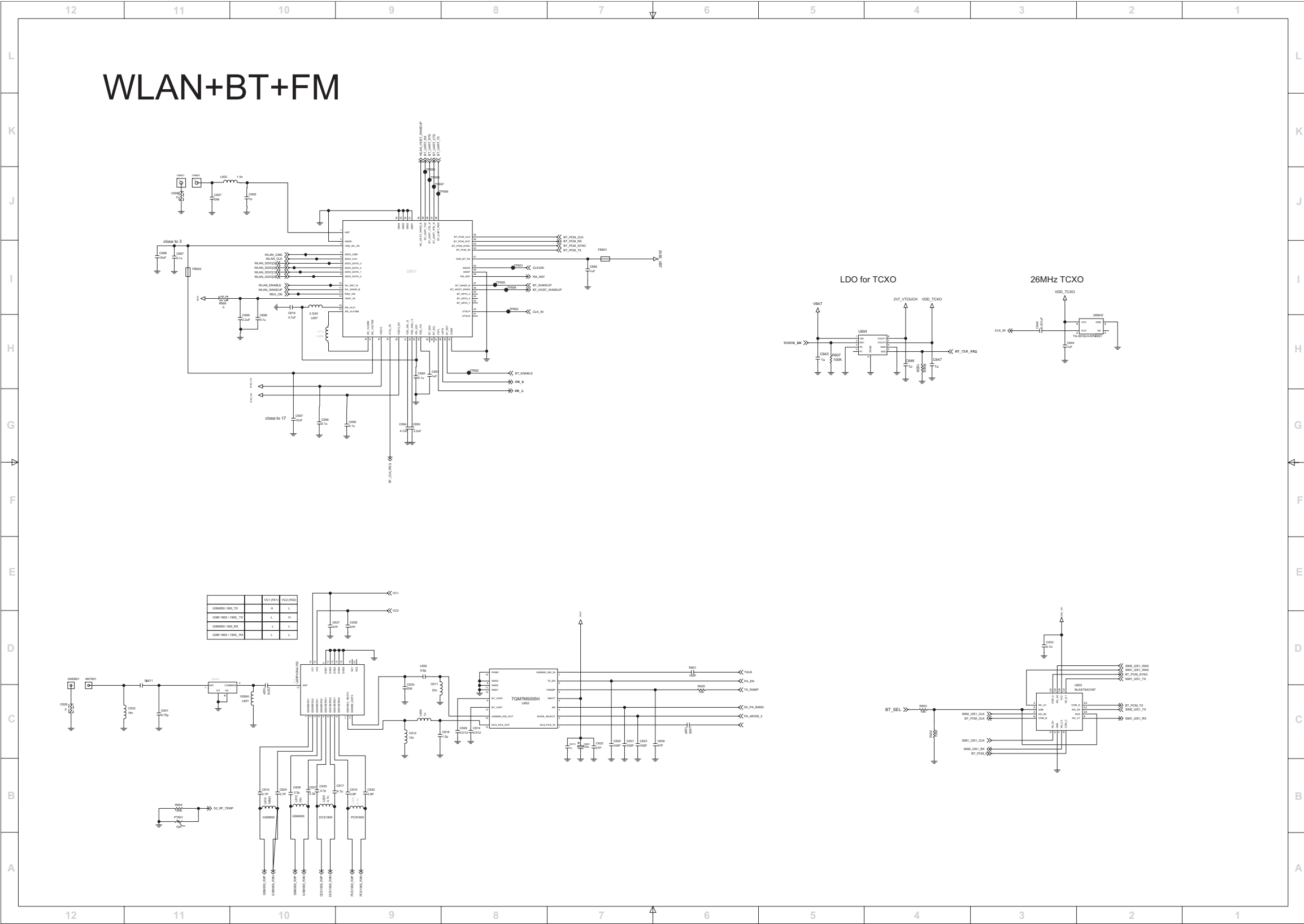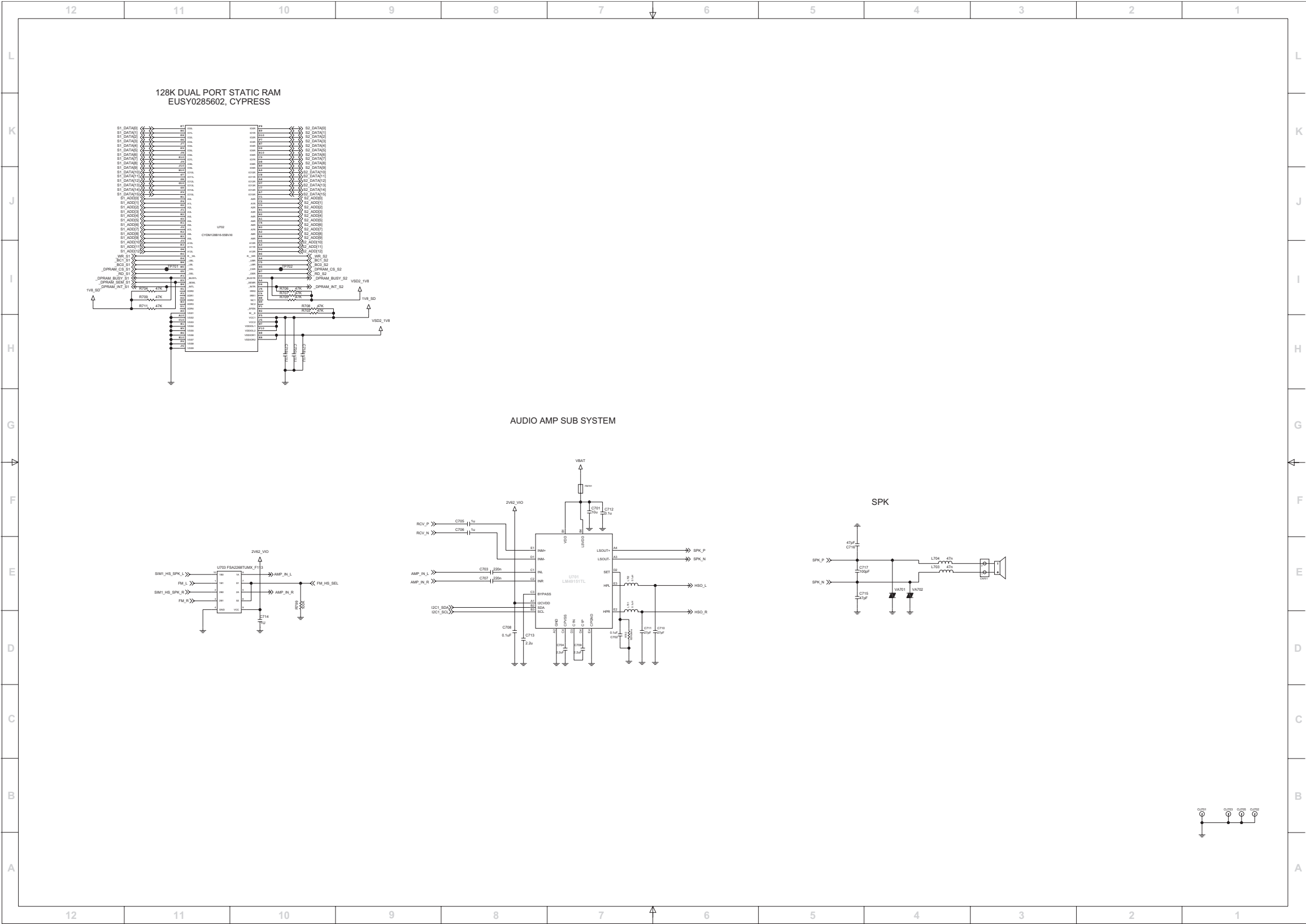
# 7. CIRCUIT DIAGRAM
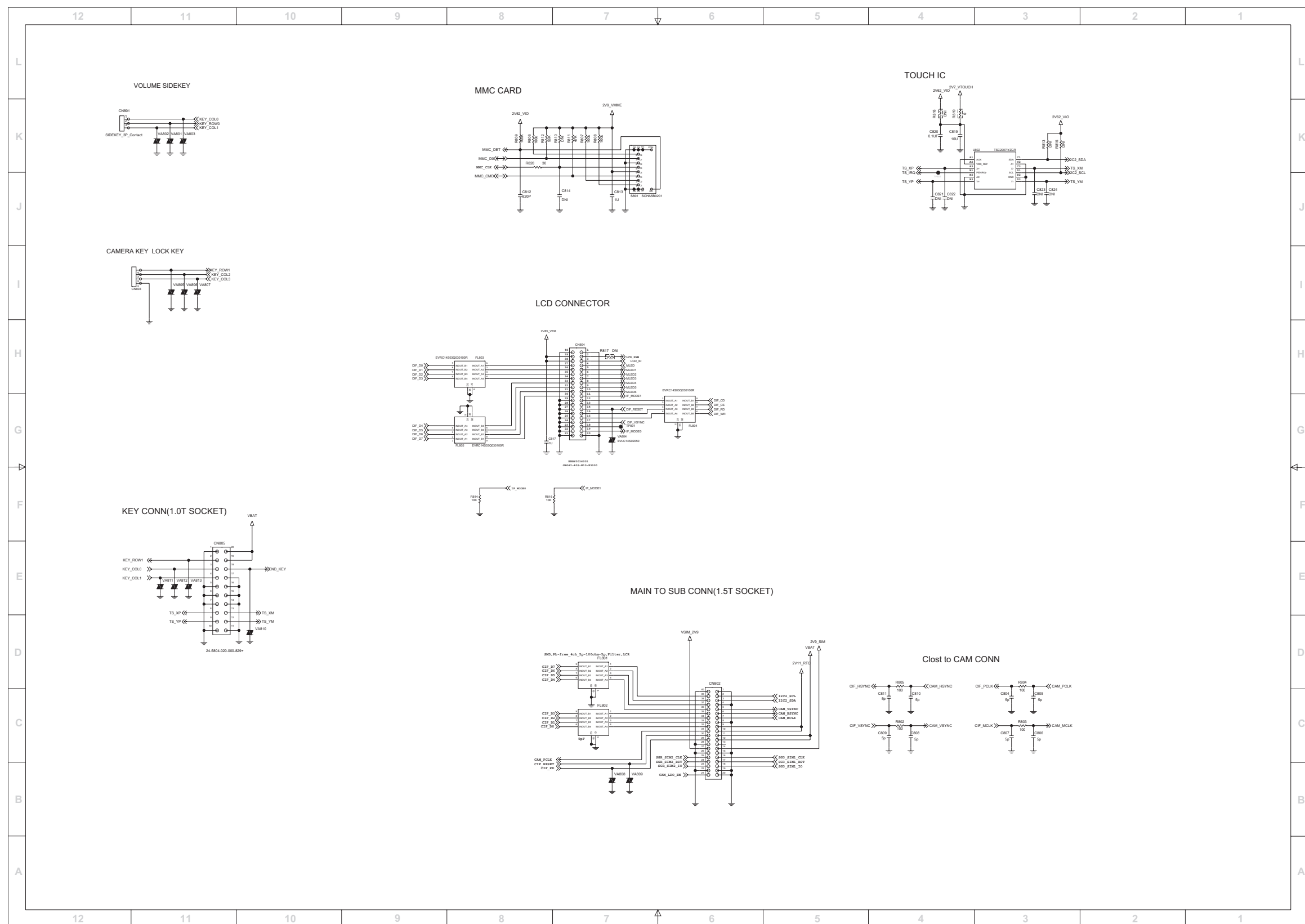
# 8. BGA Pin Map

**U309(MUIC)**

## YZP PACKAGE
### (TOP VIEW)
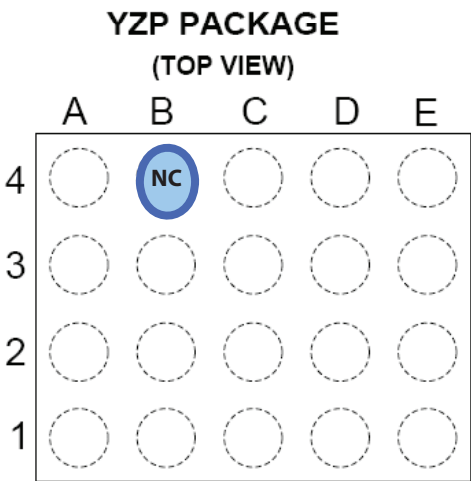


## PIN ASSIGNMENTS

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 4 | MIC | ISET | UART_TX | USB_DM | USB_DP |
| 3 | R2.2K | INT\ | UART_RX | ID | DP |
| 2 | SDA | SCL | DSS | GND | DM |
| 1 | CLDO | $V_{SUPPLY}$ | AUDIO_R | AUDIO_L | $V_{BUS}$ |

# 8. BGA Pin Map

**U701(Audio Amp Sub System)**

### 20 Bump micro SMD Package

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 4 | LSOUT+ | LSV$_{DD}$ | CPV$_{SS}$ | C1P | CPGND |
| 3 | LSOUT- | SCL | BYPASS | C1N | HPL |
| 2 | GND | SDA | INR | SET | HPR |
| 1 | I$^2$CV$_{DD}$ | V$_{DD}$ | INL | INM- | INM+ |

300925t4

**U503(S-Gold Radio)**

- 131 -

# 8. BGA Pin Map

**U502(1G NAND+512M SDRAM)**

**U102(2G NAND+1G SDRAM)**

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| A |   | DNU |   |   |   |   |   |   | DNU | DNU |
| B | NC | NC | /RE | CLE | VCCn | /CE | /WEn | VDD | VSS | NC |
| C | VSS | A4 | /WP | ALE | VSSn | R/B̄ | DQ 31 | DQ 30 | VDDQ | VSSQ |
| D | VDD | A5 | A7 | A9 | DQ 25 | DQ 27 | DQ 29 | DQ 28 | VSSQ | VDDQ |
| E | A6 | A8 | CKE | DQ 18 | NC | DQ 22 | DQM 3 | DQ 26 | VDDQ | VSSQ |
| F | A12 | A11 | NC | DQ 17 | DQ 19 | DQ 24 | DQ 23 | DQM 2 | VSSQ | VDDQ |
| G | NC | /RAS | DQ 15 | DQ 16 | NC | DQM 1 | DQ 9 | CK | VDDQ | VSSQ |
| H | VDD | /CAS | DQ 20 | DQ 21 | DQ 13 | DQ 12 | NC | NC | VSS | VDD |
| J | VSS | /CS | BA0 | DQ 14 | DQ 11 | DQ 10 | NC | DQ 0 | VSSQ | VDDQ |
| K | /WE | BA1 | A10 | A0 | DQ 7 | DQ 8 | DQ 6 | DQ 4 | VDDQ | VSSQ |
| L | A1 | A2 | A3 | DQ 0 | DQ 1 | DQ 2 | DQ 3 | DQ 5 | VDDQ | VSSQ |
| M | VDD | VSS | NC | NC | I/O 3 | I/O 5 | I/O 14 | I/O 7 | VSSQ | VDDQ |
| N | I/O 0 | I/O 1 | I/O 2 | I/O 10 | VCCn | I/O 6 | I/O 13 | I/O 15 | VDDQ | VSSQ |
| P | NC | I/O 8 | I/O 9 | I/O 11 | I/O 12 | VSSn | I/O 4 | VDD | VSS | NC |
| R | DNU | DNU |   |   |   |   |   |   | DNU | DNU |

- ● NAND
- ● DRAM
- ● NC / DNU

# 8. BGA Pin Map

**U101(S-Gold3)**

| | A | B | C | D | E | F | G | H | J | K | L | M | N | P | R | T | U | V | W | Y | AA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | NC | I2S1_WA0 | I2C2_SCL | I2S1_CLK1 | I2S2_TX | I2S2_WA0 | I2S2_CLK0 | IF2_RXD_MR | PCU_RQ_IN | VDDP_SIM | AUXN2 | AUXP1 | MICN1 | MICP1 | EPP1 | NC | NC | NC | VDDA_VBR | NC | NC | 19 |
| 18 | NC | NC | NC | RF_STR1 | I2S1_RX | I2S2_RX | SPCU_RQ_IN | RSTOUT_N | SPCU_RQ_IN | CC_CLK | AUXP2 | MICN2 | VDDA_VBT | EPN1 | EPP1 | | | | M_0 | NC | NC | 18 |
| 17 | | | | RF_STR0 | I2S1_TX | VDDP_DIGA | NC | PCU_RC_OUT | VSSP_DIG | CC_RST | AUXN1 | MICP2 | VSSA_VBT | EPN1 | VSSA_VBR | VDDA_VBR | | M_1 | NC | | | 17 |
| 16 | VDDP_DIGC1 | MON1 | NC | | I2S1_CLK0 | NC | | CC_IO | IF2_TXD_MT | PAOUT1 | AUXGND | BB_Q | AGND | VREFN | VREFP | VDDA_D | VMICN | | | NC | F32K | 16 |
| 15 | T_OUT3 | T_IN0 | | | RF_DATA | | I2S2_CLK1 | NC | GUARD | BB_QX | VSSA_BB | BB_IX | BB_I | VDDA_BB | IREF | NC | NC | | | | OSC32K | 15 |
| 14 | MMCI1_DAT[3] | T_OUT1 | _ | | TRIG_IN | USIF2_CTS_N | | | | | | | | | | | | | RESET_N | | VSS_RTC | 14 |
| 13 | VDDP_MMC | T_OUT6 | T_IN1 | | T_OUT0 | NC | | | | | | | | | | VDDA_BG | VDDA_M | | VDD_PLL | PM_INT | VDD_RTC | 13 |
| 12 | MMCI1_CLK | T_OUT10 | T_OUT9 | | T_OUT8 | | | | | VSS_MAIN | VDD_MAIN | NC | | | | VSS_PLL | F26M | | CLKOUT0 | NC | NC | 12 |
| 11 | CIF_D1 | MMCI1_DAT | T_OUT7 | | T_OUT4 | T_OUT2 | | VDD_MAIN | | VSS_MAIN | VDD_MAIN | | NC | | | FCDP_RBN | NC | | FWP | | NC | 11 |
| 10 | CIF_RESET | VSSP_DIG | MON2 | | MMCI1_CMD | MMCI1_DAT[2] | | VDD_MAIN | | VSS_MAIN | VDD_MAIN | VSS_MAIN | | | | NC | | | VSSP_MEM_ET | | | 10 |
| 9 | CIF_D2 | CIF_D5 | MMCI1_DAT[1] | | CIF_HSYNC | CIF_D0 | | VDD_MAIN | | VSS_MAIN | VDD_MAIN | VSS_MAIN | VDD_MAIN | | | NC | MEM_A[14] | | MEM_A[15] | NC | NC | 9 |
| 8 | CIF_D6 | CIF_D4 | CIF_D3 | | CIF_D7 | DIF_RESET1 | | | | VSS_MAIN | VDD_MAIN | VSS_MAIN | | | | MEM_A[2] | MEM_A[0] | | MEM_CAS_N | NC | | 8 |
| 7 | VSSP_DIG | CIF_PCLK | DIF_RESET2 | | DIF_D3 | DIF_D0 | | | | | | | | | | MEM_A[6] | MEM_A[7] | | MEM_A[12] | | NC | 7 |
| 6 | CIF_PD | CLKOUT2 | DIF_D1 | | DSPOUT1 | MMCI2_CLK | | | | | | | | | | MEM_CSA2_N | MEM_A[3] | | MEM_A[10] | MEM_A[13] | | 6 |
| 5 | VDDP_DIGB | DIF_D2 | DIF_CD | | DIF_CS2 | IF1_RXD_MR | KP_OUT3 | KP_IN3 | KP_IN1 | MEM_AD[10] | MEM_AD[3] | MEM_AD[13] | MEM_A[17] | MEM_A[24] | MEM_A[20] | MEM_CSA3_N | MEM_BC2_N | | MEM_A[4] | MEM_A[8] | MEM_A[9] | 5 |
| 4 | CIF_VSYNC | DIF_D7 | DIF_HD | | USIF3_SCLK | USIF1_CTS_N | KP_OUT0 | DSPIN0 | MEM_AD[8] | MEM_AD[9] | MEM_AD[11] | MEM_AD[14] | NC | MEM_CS1_N | MEM_WR_N | MEM_A[26] | MEM_CSA1_N | MEM_BC1_N | MEM_A[1] | MEM_BC3_N | MEM_A[5] | 4 |
| 3 | DIF_D4 | DIF_D6 | DIF_WR | MMCI2_CMD | IF3_RXD_MR | IF1_TXD_MT | KP_OUT1 | KP_IN2 | MEM_AD[2] | KP_IN6 | MEM_AD[1] | MEM_AD[4] | _ | MEM_CS1_N | MEM_WR_N | MEM_A[25] | MEM_CSA0_N | MEM_BC1_N | NC | MEM_BFCLK | DP_MEM_ET | 3 |
| 2 | DIF_D5 | VDDP_DIGD | DIF_D8 | MMCI2_DAT[0] | IF3_TXD_MT | IRDA_TX | IRDA_RX | VSSP_DIG | KP_IN4 | NC | VDD_FUSE_F | MEM_AD[0] | MEM_AD[7] | MEM_A[6] | MEM_CS0_N | MEM_A[23] | MEM_A[18] | SSP_MEM_ET | MEM_A[16] | MEM_SDCLK | MEM_BC0_N | 2 |
| 1 | NC | DIF_RD | DIF_CS1 | DIF_VD | USIF1_RTS_N | KP_OUT2 | KP_IN0 | VDDP_DIGE | KP_IN5 | MEM_RD_N | NC | | MEM_AD[5] | DP_MEM_ET | MEM_AD[12] | MEM_A[21] | SSP_MEM_ET | MEM_A[16] | VSSP_MEM_ET | DP_MEM_ET | NC | 1 |
| | B | C | D | E | F | G | H | J | K | L | | N | P | R | T | U | V | W | Y | | |

**U702**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **A** | $A_{5R}$ | $A_{8R}$ | $A_{11R}$ | $\overline{UB}_R$ | $V_{SS}$ | $\overline{SEM}_R$ | $I/O_{15R}$ | $I/O_{12R}$ | $I/O_{10R}$ | $V_{SS}$ |
| **B** | $A_{3R}$ | $A_{4R}$ | $A_{7R}$ | $A_{9R}$ | $\overline{CE}_R$ | $R/\overline{W}_R$ | $\overline{OE}_R$ | $V_{DDIOR}$ | $I/O_{9R}$ | $I/O_{6R}$ |
| **C** | $A_{0R}$ | $A_{1R}$ | $A_{2R}$ | $A_{6R}$ | $\overline{LB}_R$ | NC | $I/O_{14R}$ | $I/O_{11R}$ | $I/O_{7R}$ | $V_{SS}$ |
| **D** | NC | NC | $\overline{BUSY}_R$ | $\overline{INT}_R$ | $A_{10R}$ | $A_{12R}$[3] | $I/O_{13R}$ | $I/O_{8R}$ | $I/O_{5R}$ | $I/O_{2R}$ |
| **E** | $V_{SS}$ | $M/\overline{S}$ | NC | $\overline{INT}_L$ | $V_{SS}$ | $V_{SS}$ | $I/O_{4R}$ | $V_{DDIOR}$ | $I/O_{1R}$ | $V_{SS}$ |
| **F** | $\overline{SFEN}$ | NC | $\overline{BUSY}_L$ | $A_{1L}$ | $V_{CC}$ | $V_{SS}$ | $I/O_{3R}$ | $I/O_{0R}$ | $I/O_{15L}$ | $V_{DDIOL}$ |
| **G** | NC | $A_{2L}$ | $A_{5L}$ | $A_{12L}$[3] | $\overline{OE}_L$ | $I/O_{3L}$ | $I/O_{11L}$ | $I/O_{12L}$ | $I/O_{14L}$ | $I/O_{13L}$ |
| **H** | $A_{0L}$ | $A_{4L}$ | $A_{9L}$ | $\overline{LB}_L$ | $\overline{CE}_L$ | $I/O_{1L}$ | $V_{DDIOL}$ | NC | NC | $I/O_{10L}$ |
| **J** | $A_{3L}$ | $A_{7L}$ | $A_{10L}$ | NC | $V_{CC}$ | $V_{SS}$ | $I/O_{4L}$ | $I/O_{6L}$ | $I/O_{8L}$ | $I/O_{9L}$ |
| **K** | $A_{6L}$ | $A_{8L}$ | $A_{11L}$ | $\overline{UB}_L$ | $\overline{SEM}_L$ | $R/\overline{W}_L$ | $I/O_{0L}$ | $I/O_{2L}$ | $I/O_{5L}$ | $I/O_{7L}$ |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

# 8. BGA Pin Map

## U201(PMIC)

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |   |
|---|---|---|---|---|---|---|---|---|---|----|----|---|
| A | PUMS1 | DAT_VP | SUSPEND | VUSB | VREFEX_M | NC | NC | NC | NC | VPLL | VIO | A |
| B | NC | SE0_VM | AC_Plus | PUMS2 | VDDUSB | MONO_INP | VDD_MONO | RREF | VDDPLLIO | TXONPA | PUMS3 | B |
| C | D_Plus | NC | AC_Minus | OE_N | MONO_IN | VSS | VSS_MONO | VREF | NC | VDDMME | VMME | C |
| D | NC | D_Minus | NC | VSS | VSS | VSS | VSS | VSS | VSS_VREF | VDDRF2 | VRF2 | D |
| E | SLEEP2_N | SLEEP1_N | RESET_N | VSS | VSS | VSS | VSS | VSS | VSS | VRF3 | VDDRF13AFC | E |
| F | VDDAUDIOA | VAUDIOA | VSS | VSS | VSS | VSS | VSS | VSS | VSS | VRF1 | VVIB | F |
| G | VAUDIOB | VDDAUDIOB | VSS | VSS | VSS | VSS | VSS | VSS | VSS | VSIM | VDDSIMVIB | G |
| H | VDDAUX | VAUX | NC | VSS_SD2 | VSS | VSS | VSS | VSS_SD1 | VDDUMTS | VRTC | VAFC | H |
| J | NC | SU1_GND | NC | NC | RESOURCE_CTRL | VSS | I2C_CLK | NC | VDD_REF | SD1_FB | VUMTS | J |
| K | VDDSD2 | SD2_FB | NC | ON_OFF1 | I2C_INT | I2C_DAT | | CH_SOURCE | VDDCHARGE | SENSE_IN2 | VDDSD1 | K |
| L | VSD2 | SD2_FBL | WDOG | ON_OFF2 | NC | NC | NC | CHARGE_UC | SENSE_IN1 | SD1_FBL | VSD1 | L |
|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |   |

**U802(Touch IC)**

| Rows | A | B | C | D |
|---|---|---|---|---|
| 3 | X+ | Y+ | X− | Y− |
| 2 | VDD/REF | A0 | A1 | GND |
| 1 | AUX | $\overline{\text{PENIRQ}}$ | SDA | SCL |

Columns

# 9. PCB LAYOUT

U307 MIC Bias LDO
- No MIC Sound

U304 MIC Switch
- No MIC Sound

MIC301  MIC
- No MIC Sound
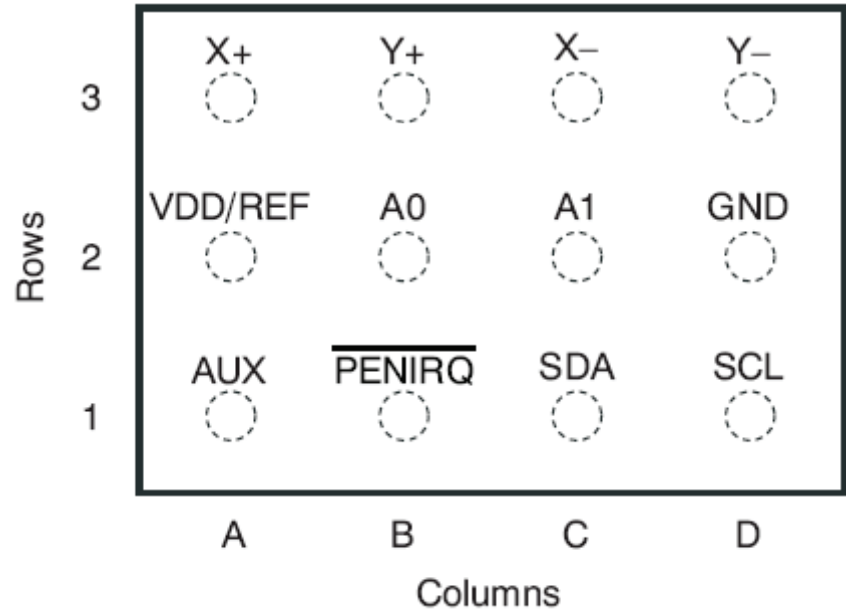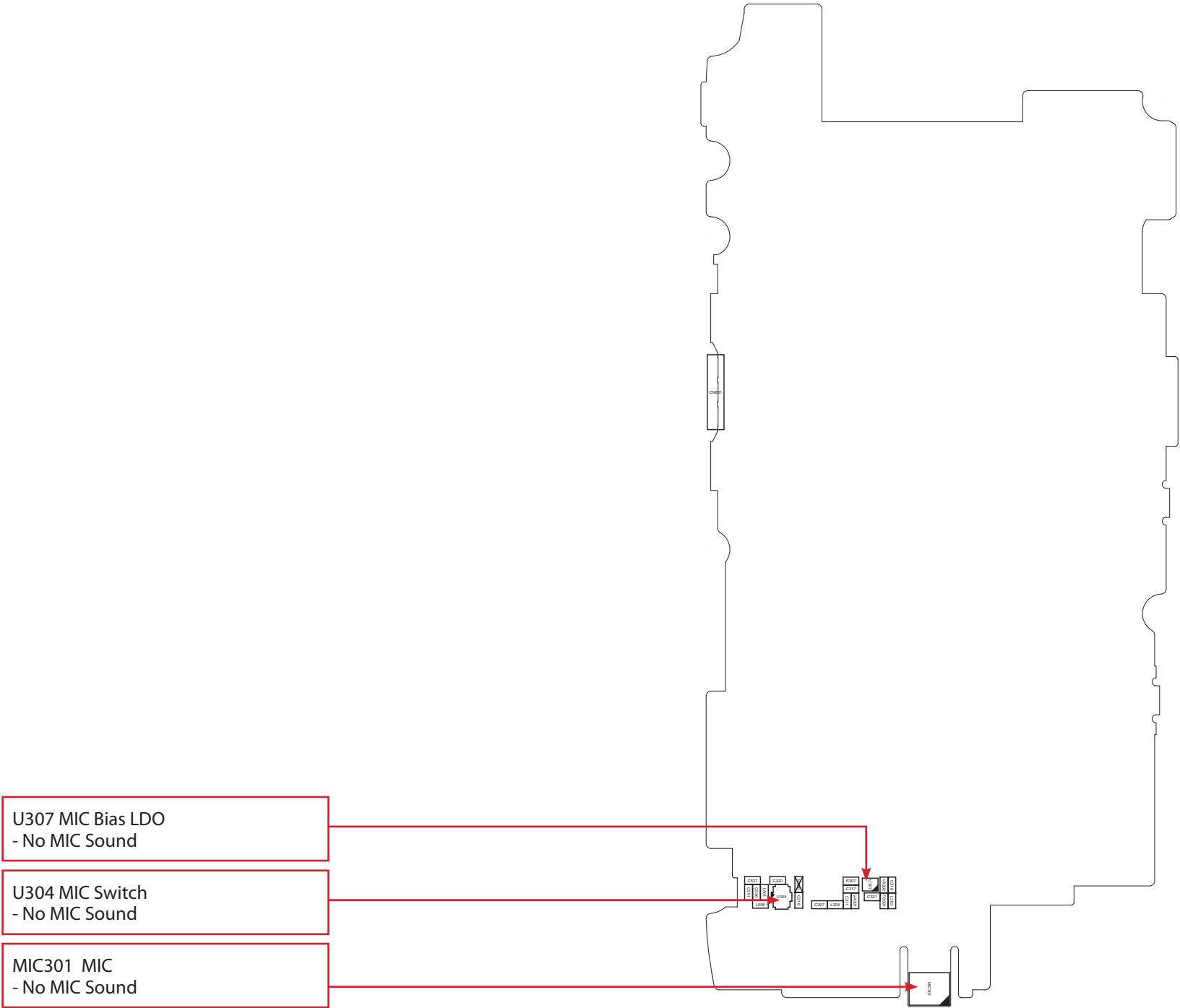
GX500_MAIN_SPFY0216901_1.0_TOP

# 9. PCB LAYOUT

U308 Analog Switch
- No Download

U701 Audio subsystem
- No Sound

U309 5 pin u-USB control IC
- No booting, No USB

U303, 305, 703  Analog SW
- No Sound

U310 Single Charger IC
- No Charging

U301 Dual Analog Switch
- No USB Connection

U702 Dual Port Static RAM
- Lock up

U102 Memory for U101
- No booting

U201 PMIC
- No power, No Service

U101 SIM1, Baseband IC- No power
on, No Service

U802 Touch IC
- No touch screen

U204 Motor Driver IC
- No vibrator

U503 SIM2, Baseband IC
- No Power On
- No Service

U502 Memory for U503
- No Booting

U302 Dual Analog Switch
- No UART

Q501 TR
- SIM2, No Booting

Q201 Dual TR
- No power on

U205 Charge pump
- No LCD Backlight

U501 Dual AND Gate
- SIM2 No Booting

U203 3axis accelerometer
- No Swivel detect

GX500_MAIN_SPFY0216901_1.0_BOT

# 9. PCB LAYOUT

SIM1 RF

SIM2 RF

BT/WI-FI/FMR

FL1 SIM2 FEM
- SIM2 no Service
- RF Sensitivity & TX Power

U602 SIM2 EDGE PAM
- SIM2 No service
- No power on

X502 SIM2 26MHz X-TAL
- No power on, No service

X601 26MHz TCXO
- No BT, WiFi, FM radio

U601 WiFi(b/g)+BT2.1+FM Rx
- No BT, WiFi, FM radio

U604 Dual LDO
- No BT, WiFi, FM radio

U603 Quad DPDT Analog Switch
- No BT

X401 SIM1 26MHz X-TAL
- No power on, No service

U402 SIM1 EDGE PAM
- SIM1 no Service
- RF Sensitivity & TX Power

U401 SIM1 GPRS, EDGE TRANSCEIVER
- no Service
- RF Sensitivity & TX Power

FL401 SIM1 FEM
- SIM2 no Service
- RF Sensitivity & TX Power

GX500_MAIN_SPFY0216901_1.0_BOT

# 9. PCB LAYOUT

R12 C106 C111

R113
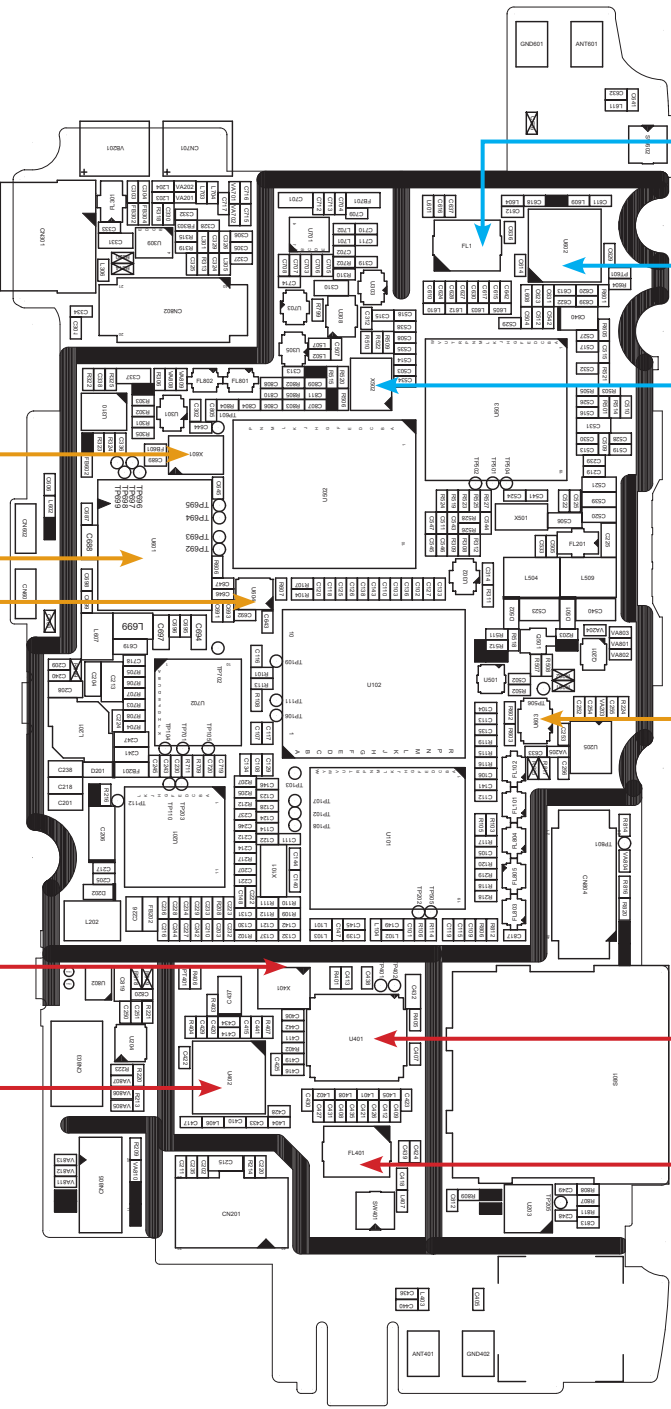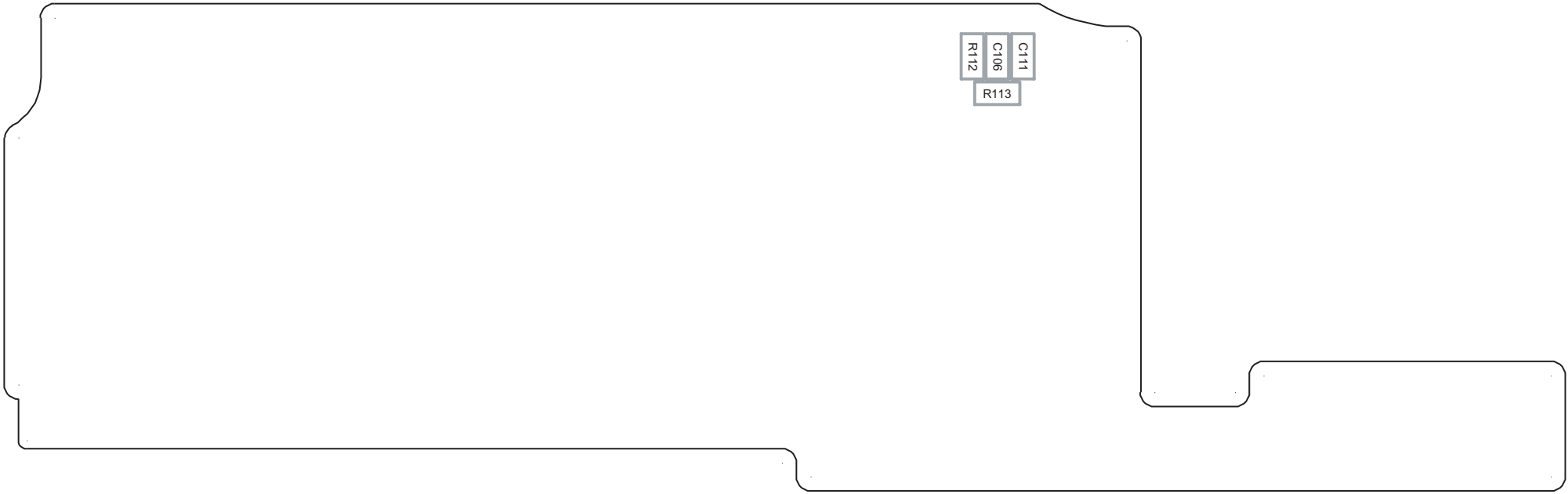
GX500_F_SUB_SPCY0225601_1.0_TOP

# 9. PCB LAYOUT
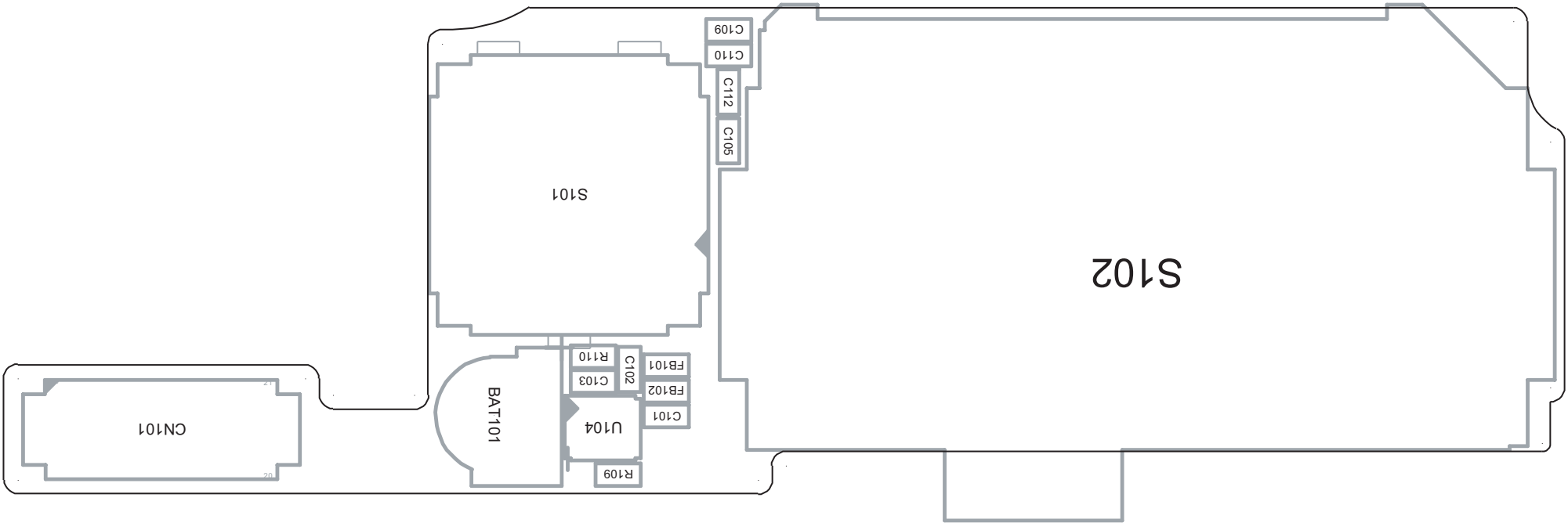


GX500_F_SUB_SPCY0225601_1.0_BOT

# 9. PCB LAYOUT

CN101

MENU

SEND

END
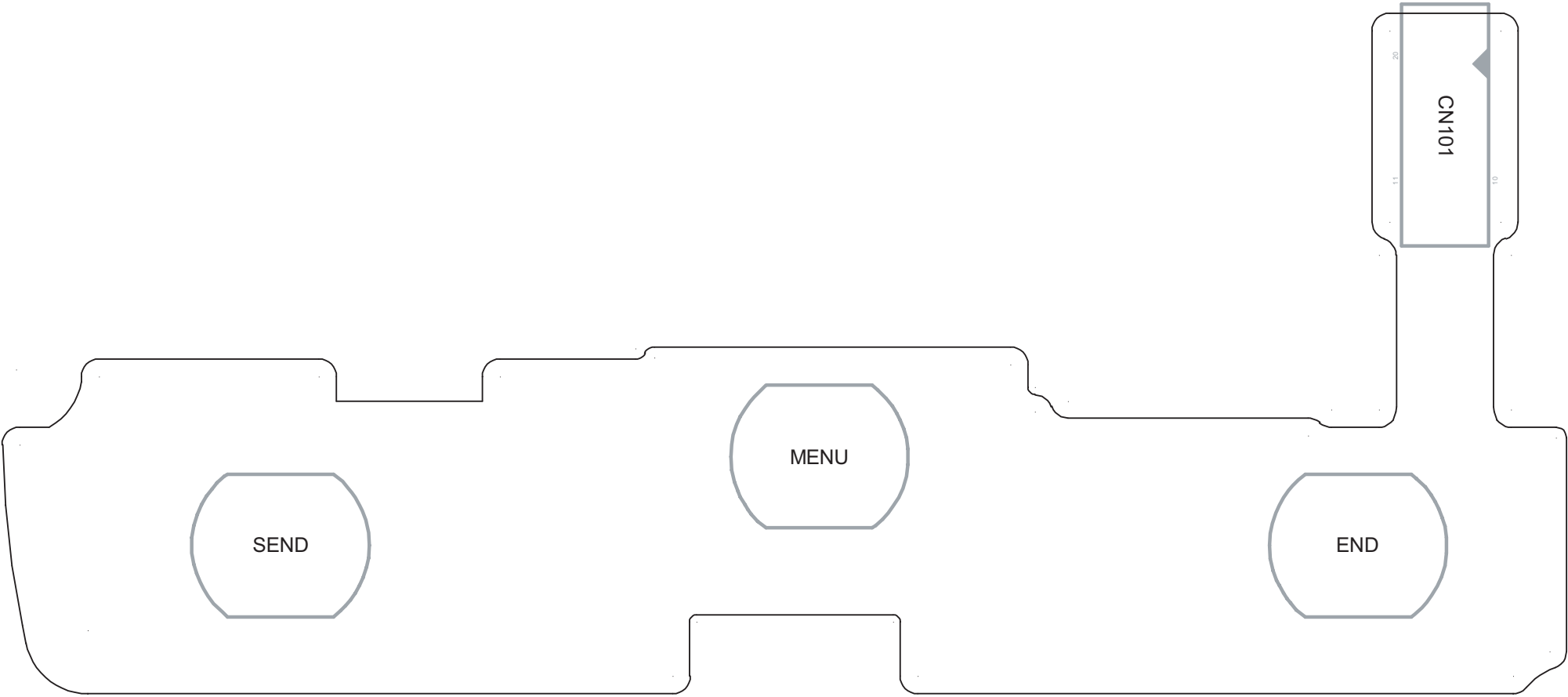
GX500 F_KEY SPCY0212301_1.0_TOP

# 9. PCB LAYOUT

CN102

GX500 F_KEY SPCY0212301_1.0_ BOT

# 10. RF CALIBRATION

## 10.1 Test Equipment Setup
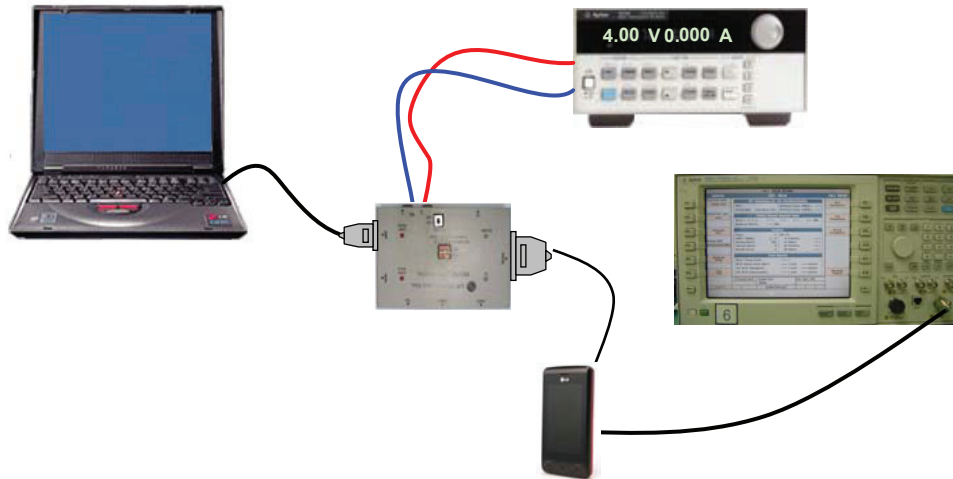


## 10.2 Calibration Step

2.1. Turn on the Phone.
2.2. Execute "HK_34.exe"
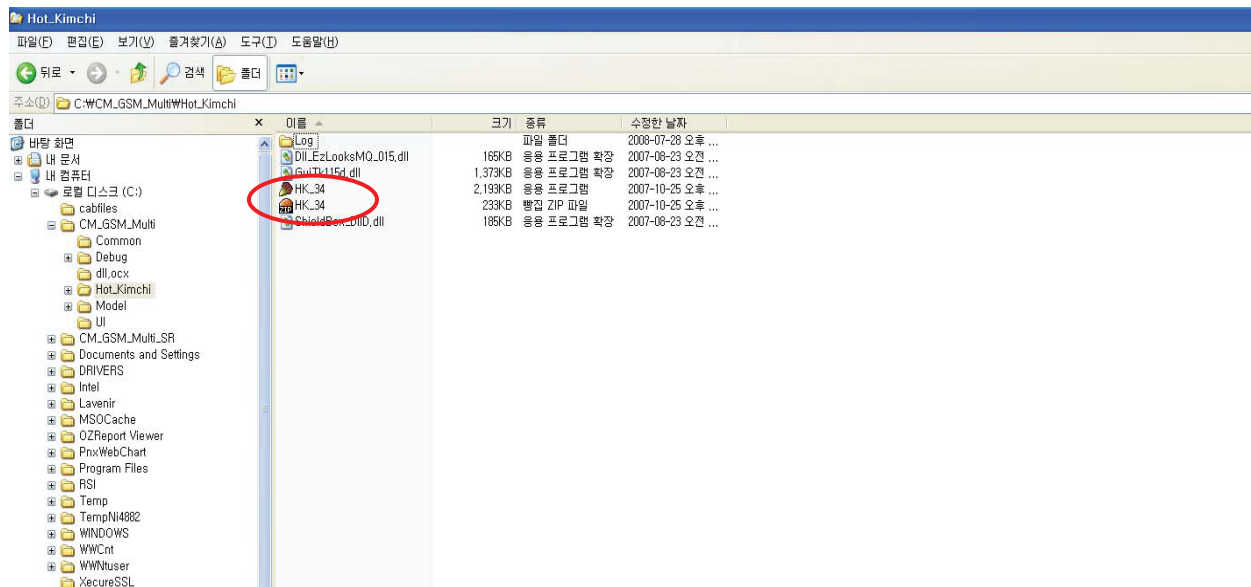
# 10. RF CALIBRATION

## 2.3. Click "SETTING" Menu
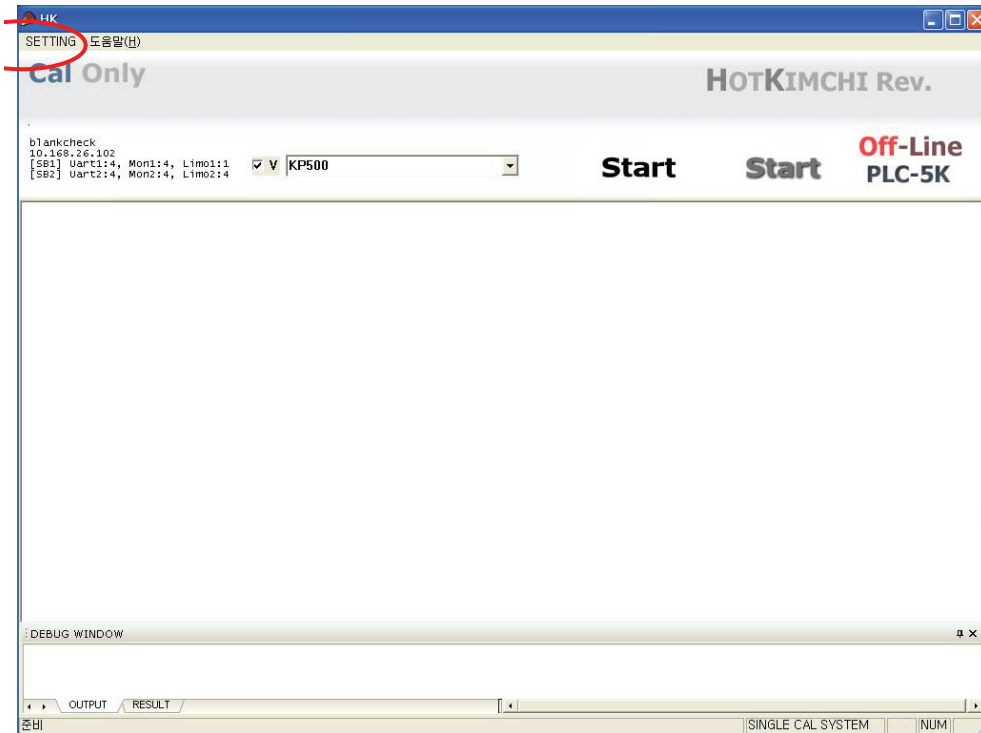


## 2.4. Setup "Ezlooks" menu such as the following figure



- 148 -
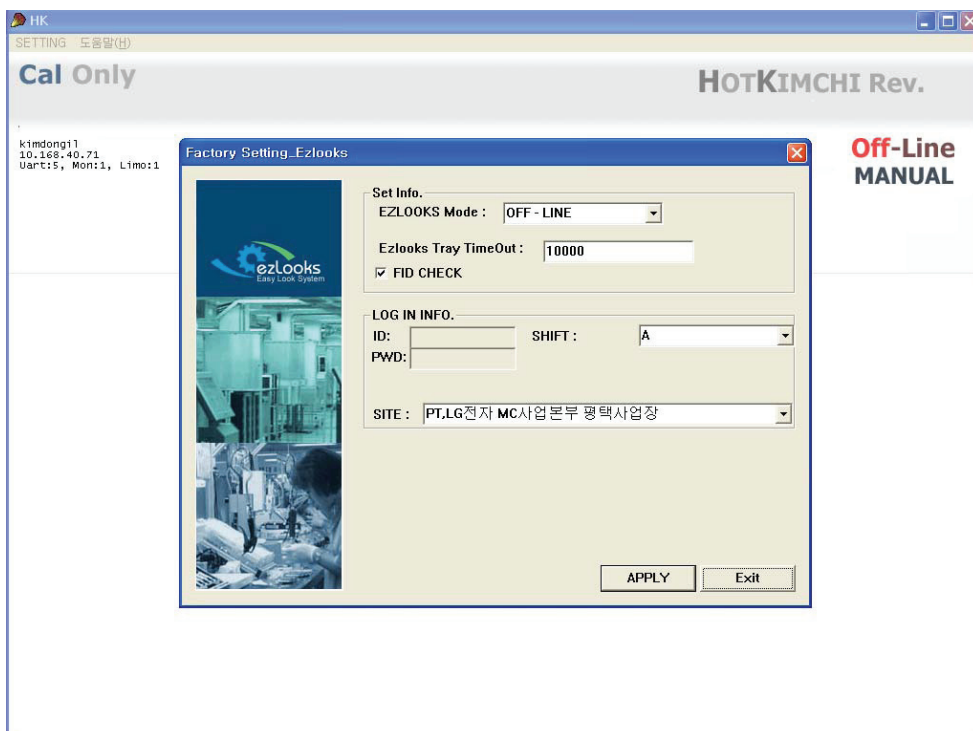
2.5. Setup "Line System" menu such as the following figure
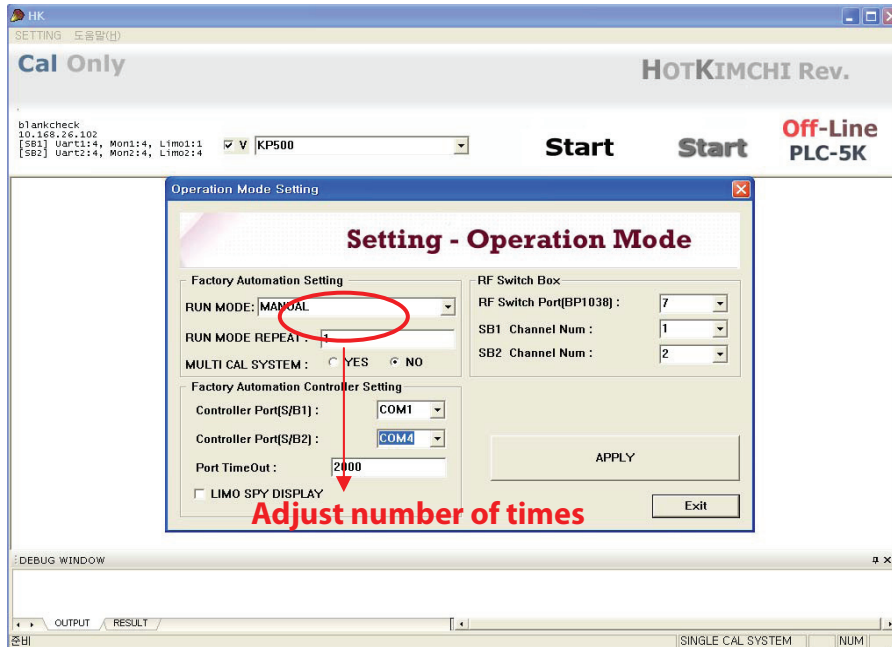


Setup Logic operation such as the following figure.
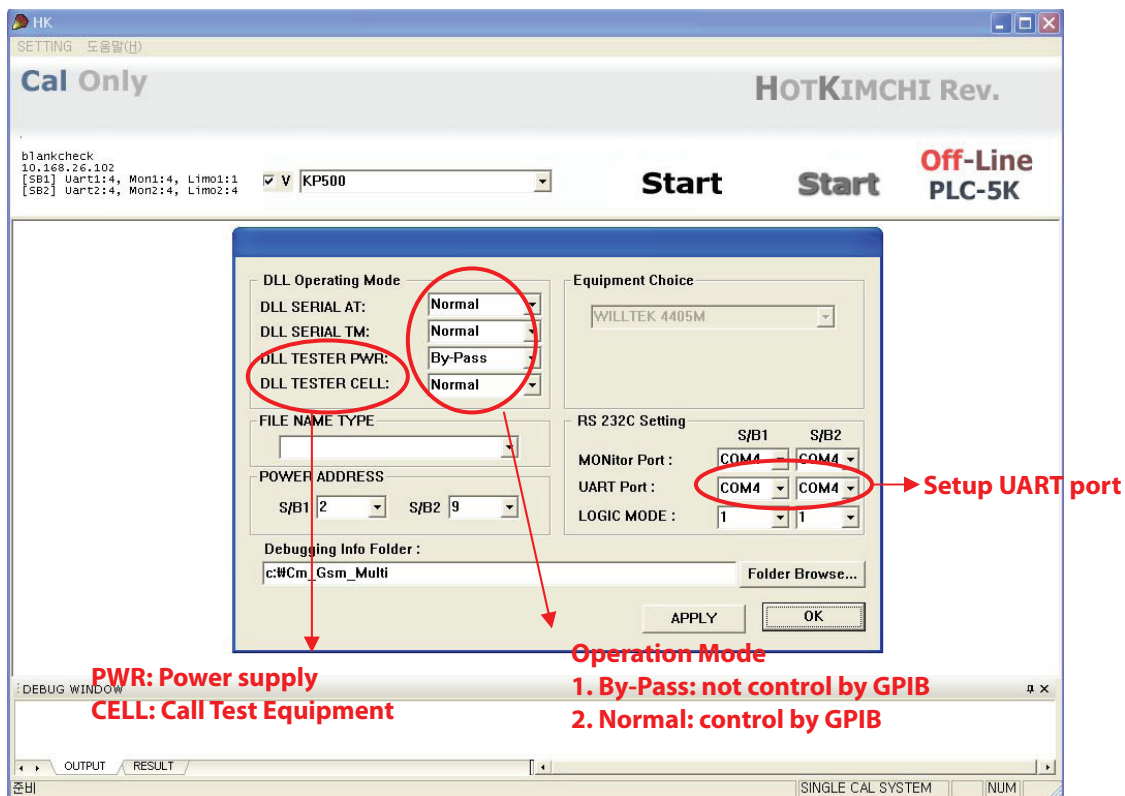
# 10. RF CALIBRATION

2.7. Select "MODEL".
2.8. Click  "START" for RF calibration
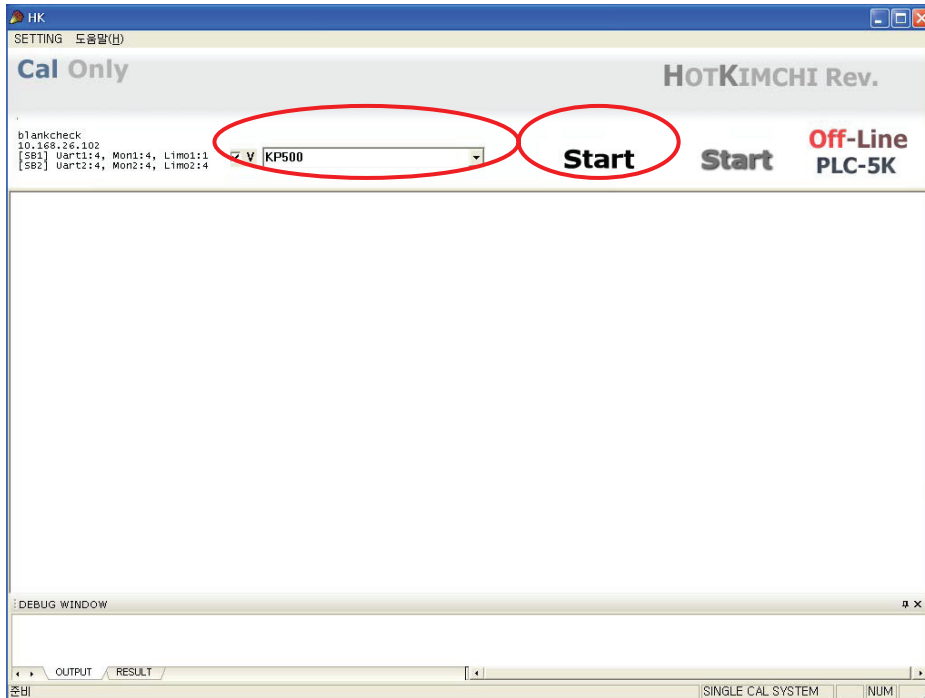


2.9. RF Calibration finishes.
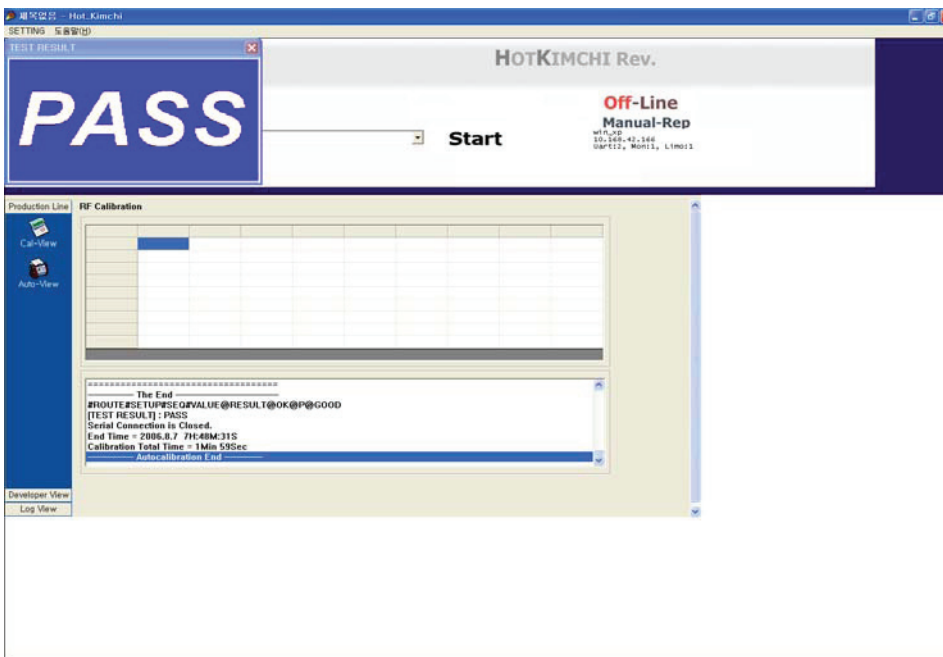
2.10. Calibration data will be saved to the following folder.



Saving Format:
Year/month/day. pass or fail
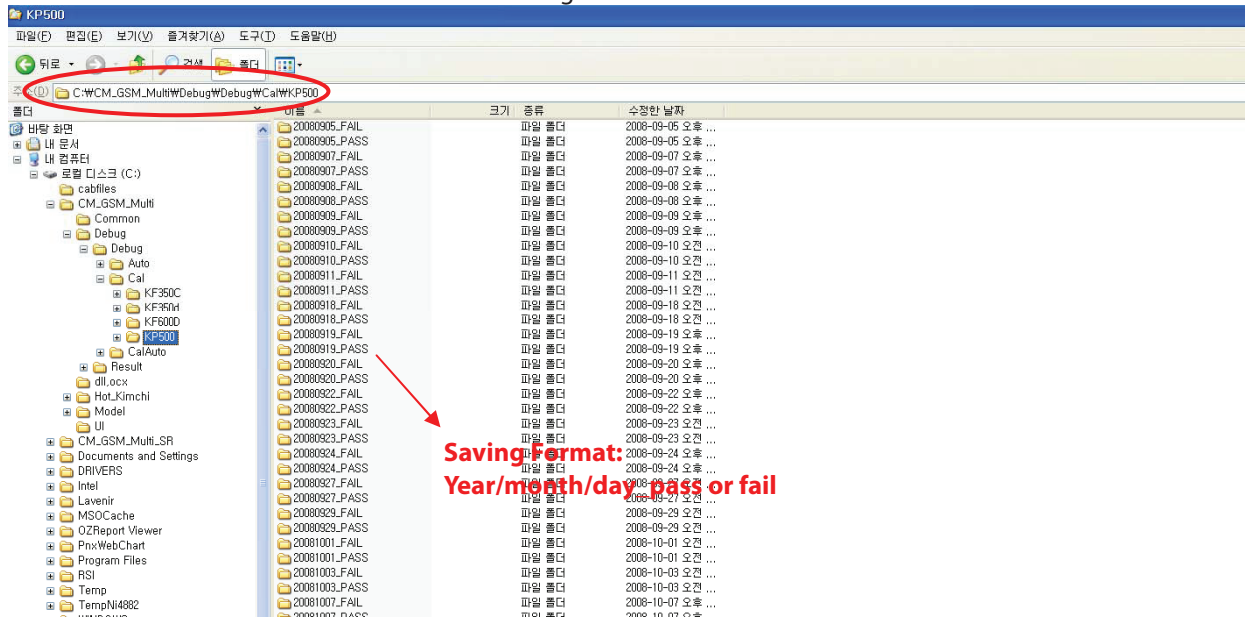
**Notices:**

1. The state of Phone is " test mode " during the CALIBRATION.

2. Calibration program automatically changes either "normal mode" or "ptest mode".

3. RF Calibration steps as follow:

TX Channel compensation:

SIM1:DCS1800->GSM900->PCS1900->GSM850->EDGE_PCS1900->EDGE_GSM850->
EDGE_GSM900->EDGE_DCS1800

SIM2: DCS1800->GSM900->PCS1900->EDGE_PCS1900->EDGE_GSM900->EDGE_DCS1800

RX Channel compensation:

SIM1 :EGSM->GSM850->DCS->PCS

SIM2 :EGSM->DCS->PCS
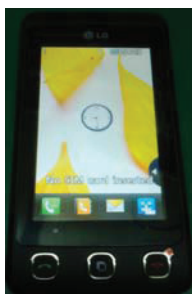


< Normal Mode >          < Ptest Mode>

# 11. STAND ALONE TEST

## 11.1 SIM1 TEST

### 11.1.1 Test Program Setting

① Set COM Port.
② Check PC Baud rate.
③ Confirm EEPROM & Delta file prefix name.
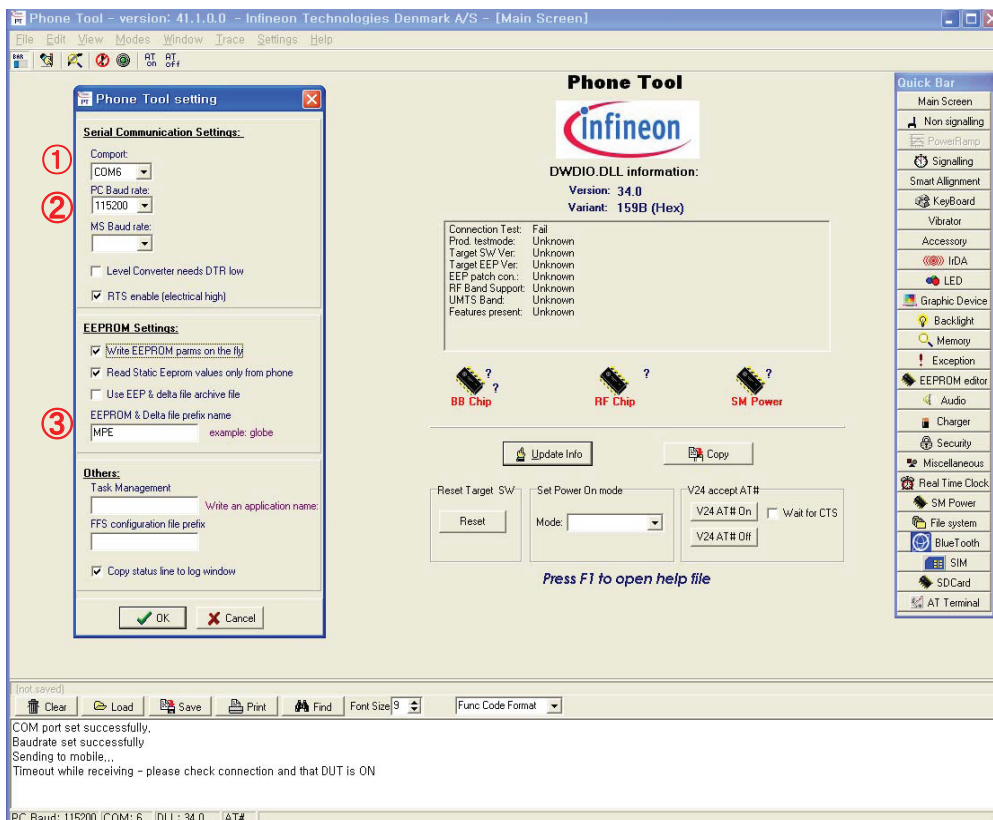
④ Click "Update Info" for communicating Phone and Test-Program.
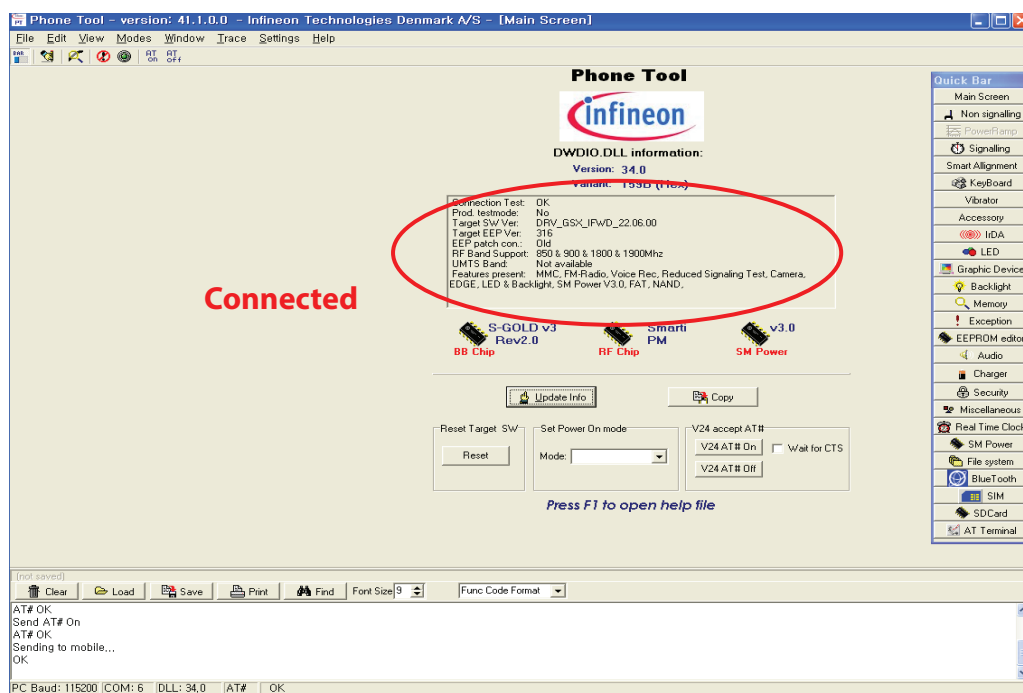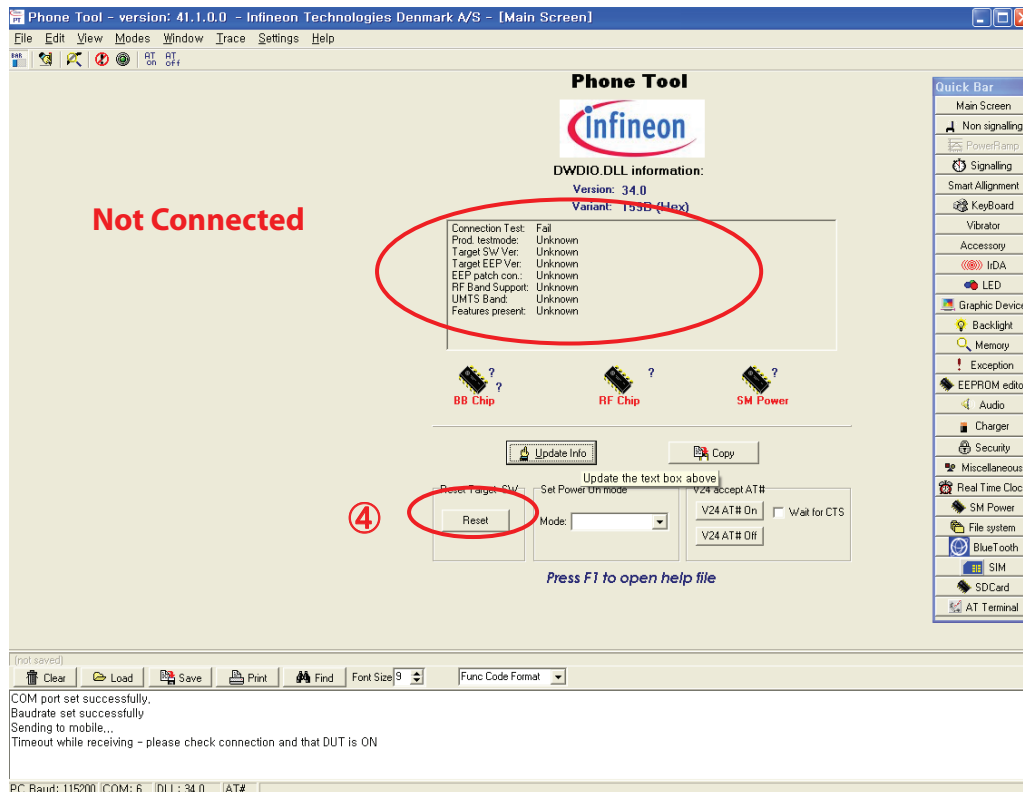
⑤For the purpose of the Standalone Test, Change the Phone to "ptest mode" and then Click the "Reset" bar.
⑥Select "Non signaling" in the Quick Bar menu. Then Standalone Test setup is finished.



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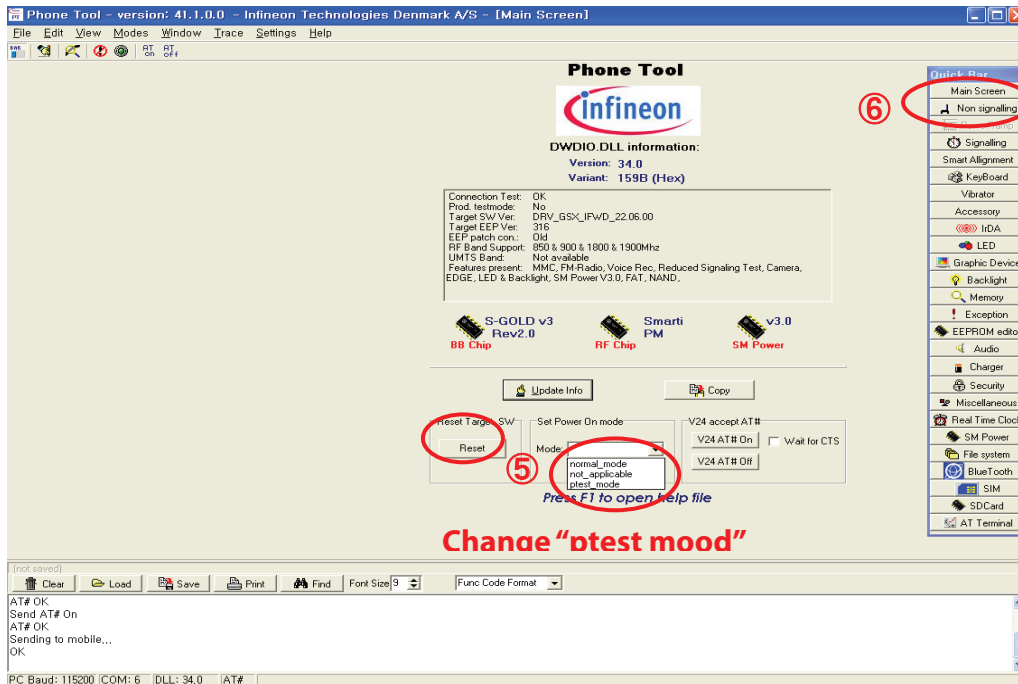
## 11.1.2 Tx Test

①Click "Non signaling mode" bar and then confirm "OK" text in the command line.
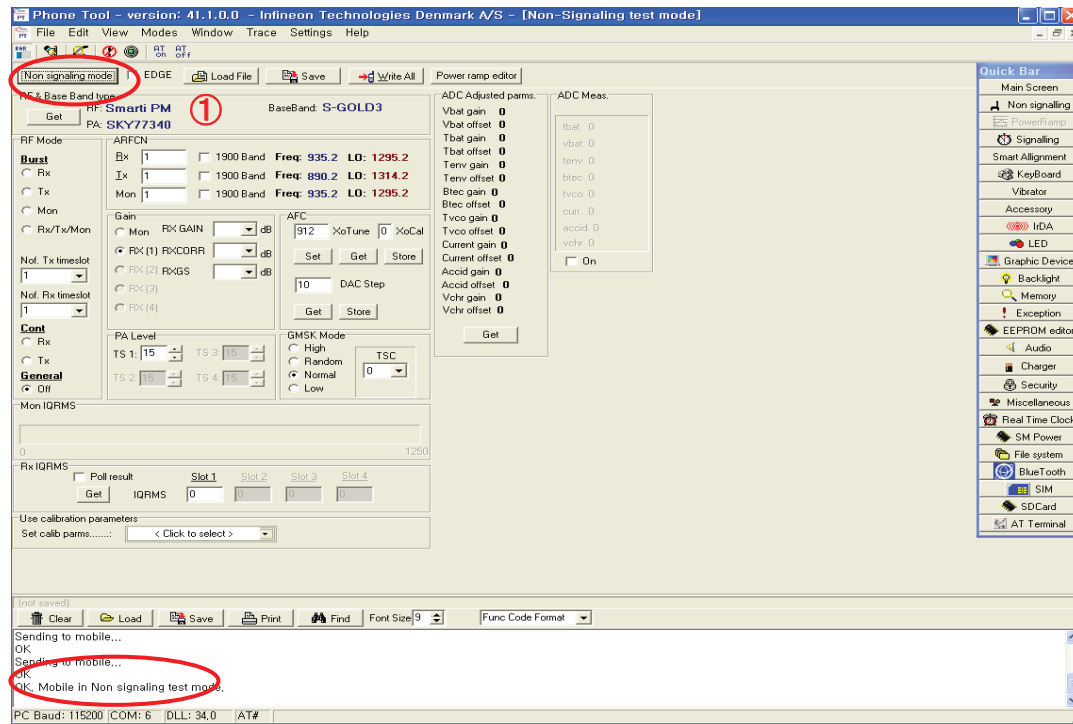
# 11. STAND ALONE TEST

②Put the number of TX Channel in the ARFCN.
③Select "Tx" in the RF mode menu and "PCL" in the PA Level menu.
④Finally, Click "Write All" bar and try the efficiency test of Phone.
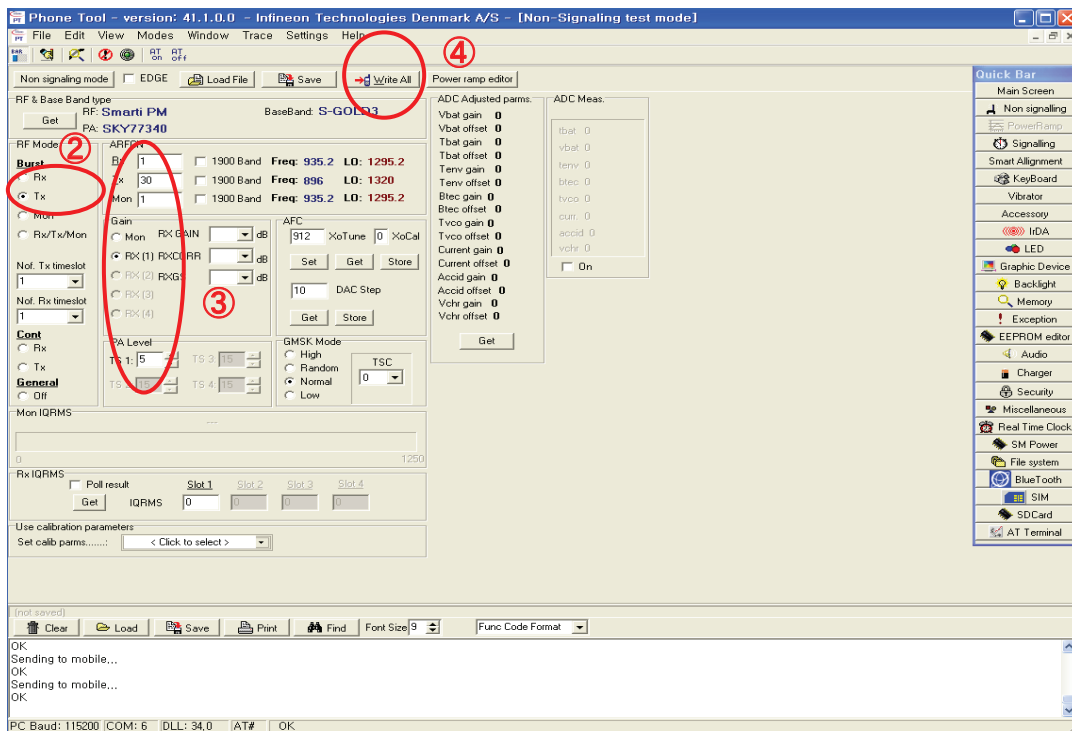


## 11.1.3 Rx Test

①Put the number of RX Channel in the ARFCN.

②Select "Rx" in the RF mode menu.

③Finally, Click "Write All" bar and try the efficiency test of Phone.
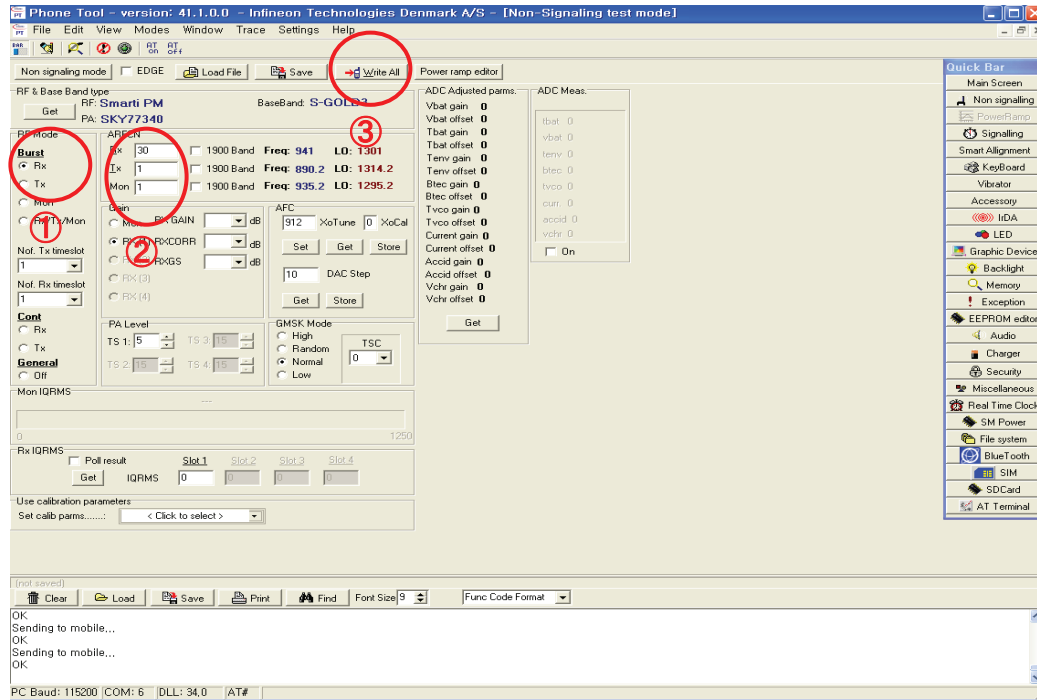
# 11. STAND ALONE TEST

④The Phone must be changed "normal mode" after finishing Test.
⑤Change the Phone to "normal mode" and then Click the "Reset" bar.\
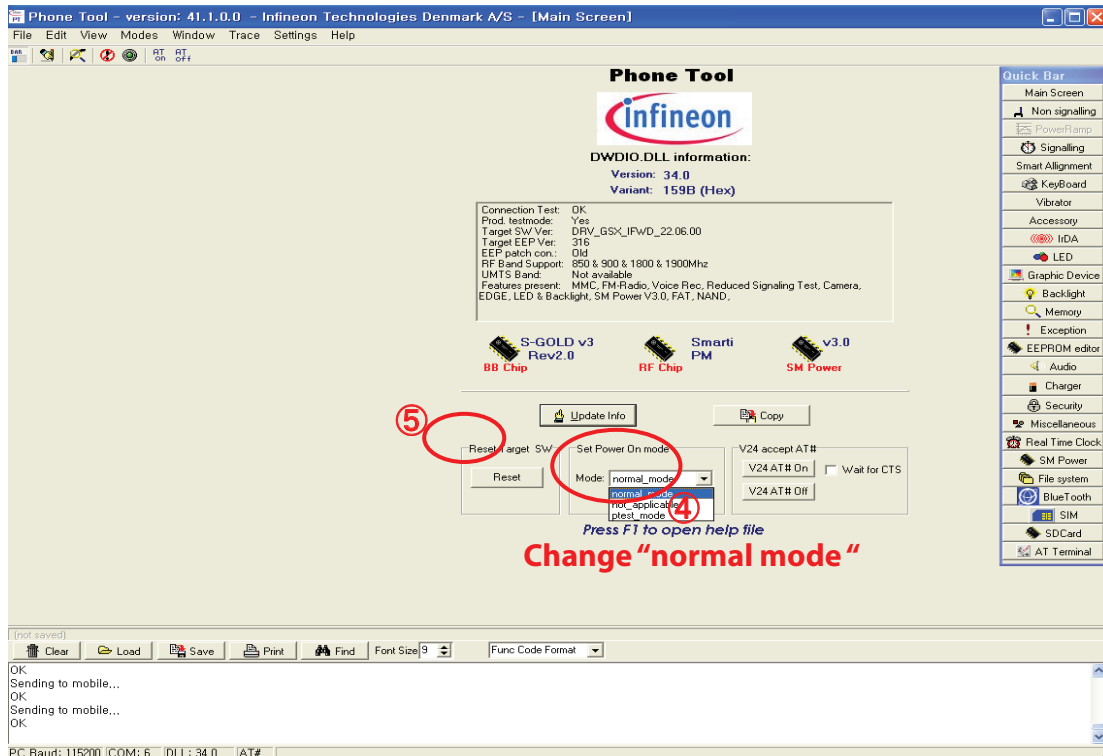
## 11.2 SIM2 TEST

### 11.2.1 Test Program Setting

① AT%uartpath=1(Connected SIM2)
② Same with SIM1.

### 11.2.2 SIM2 Tx Test

①Click "PowerRamp" bar
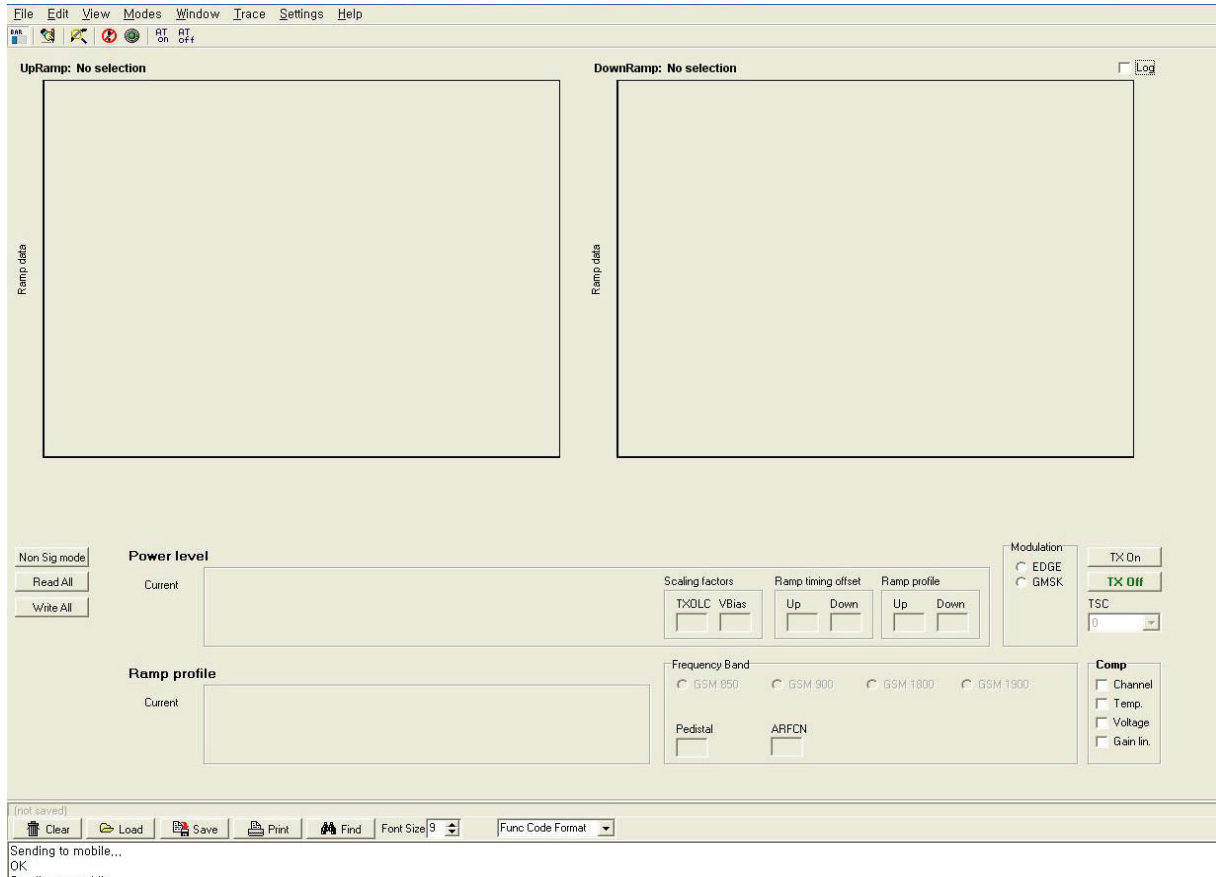
② Select Frequency Band
③ Put the number of TX Channel in the ARFCN.
④ Finally, Click "Power Level" bar and try the efficiency test of Phone.

## 11.2.3 Rx Test

Same with SIM1

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# 12. ENGINEERING MODE

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset. The key sequence for switching the engineering mode on is "1809#*500#". Pressing END will switch back to non-engineering mode operation. Drag a screen to select a menu and press 'OK' to progress the test. Pressing 'BACK' will switch back to the original test menu. Engineering mode(Test Mode) can be divided by 'Factory Mode' and 'Eng Mode'

**- Factory Mode**

**[1] Device Test**
  [1-1] Function Test
  [1-2] Main LCD
  [1-3] LCD Backlight
  [1-4] Key Backlight
  [1-5] Speaker
  [1-6] Vibrator
  [1-7] Camera
  [1-8] MicRcv
  [1-9] Keypad
  [1-10] Motion Sensor Test
**[2] ELT Mode**
  **[2-1] AutoMatic**
  **[2-2] Manual**
    [2-2-1] LCD Backlight
    [2-2-2] Ringtones
    [2-2-3] Vibrator
    [2-2-4] Camera
    [2-2-5] Auto Loopback
    [2-2-6] Ring & Vibrator
**[3] SW Sanity Test**
  [3-1] E Serial NO
  **[3-2] UA.Strung**
    [3-2-1] Browser Setting
    [3-2-2] Push Dump
    [3-2-3] Send Message
    [3-2-1] Savepage Dump
  [3-3] Unlock SIM
**[4] Version**
**[5] Factoru Reset**

**- Eng Mode**

**[1] Usage Info**
  [1-1] Call Timer
  [1-2] User Tendency
  [1-3] Usage Tracking

**[2] Eng Mode**
  **[2-1] Device Info**
    [2-1-1] Battery info
    [2-1-2] LCD Info
    [2-1-3] Firmware Info
  **[2-2] Audio Tunning**
    [2-2-1] Handset
    [2-2-2] Headset
    [2-2-3] Speaker Phone
    [2-2-4] Bluetooth Headset
    [2-2-5] Tunning Info
    [2-2-6] Default
    [2-2-7] Save to File
  **[2-3] Audio Tunning Remote**
    [2-3-1] Handset
    [2-3-2] Headset
    [2-3-3] Speaker Phone
    [2-3-4] Bluetooth Headset
    [2-3-5] Tunning Info
    [2-3-6] Default
    [2-3-7] Save to File
  **[2-4] UART Setting**
    [2-4-1] Auto
    [2-4-2] AT CMD
    [2-4-3] UART Info
  **[2-5] BT Testing**
    [2-5-1] Audio Test
    [2-5-2] RF Test

  **[2-6] WLAN Service**
    [2-6-1] Net Info
    [2-6-2] Rx Tx Test
    [2-6-3] Open
    [2-6-4] IP Configuration
    [2-6-5] Available Net
    [2-6-6] OTA Mode ON
    [2-6-7] OTA Mode OFF
    [2-6-8] Iperf Test
    [2-6-9] Close
    [2-6-10] Disconnect
  **[2-7] Defect Report System**
**[3] Band Select**
**[4] Band Select Remote**
**[5] Network Info**
**[6] Others**
  [6-1] Bluetooth test Mode
  [6-2]Aging Test
  [6-3] Touch Screen Test
  [6-4] FM Radio Test
  [6-5] Debug Test
  [6-6] Keytone Aging
  [6-7] Touch Calibration
  [6-8] Common Test
  [6-9] Trace Option
  [6-10] FPRI Test
  [6-11] Bypass Booting Mode
  [6-12] FXUI Debug Setting

# 13. EXPLODED VIEW & REPLACEMENT PART LIST

## 13.1 EXPLODED VIEW



UPPER SUBASSY    MIDDLE SUBASSY    REAR SUBASSY
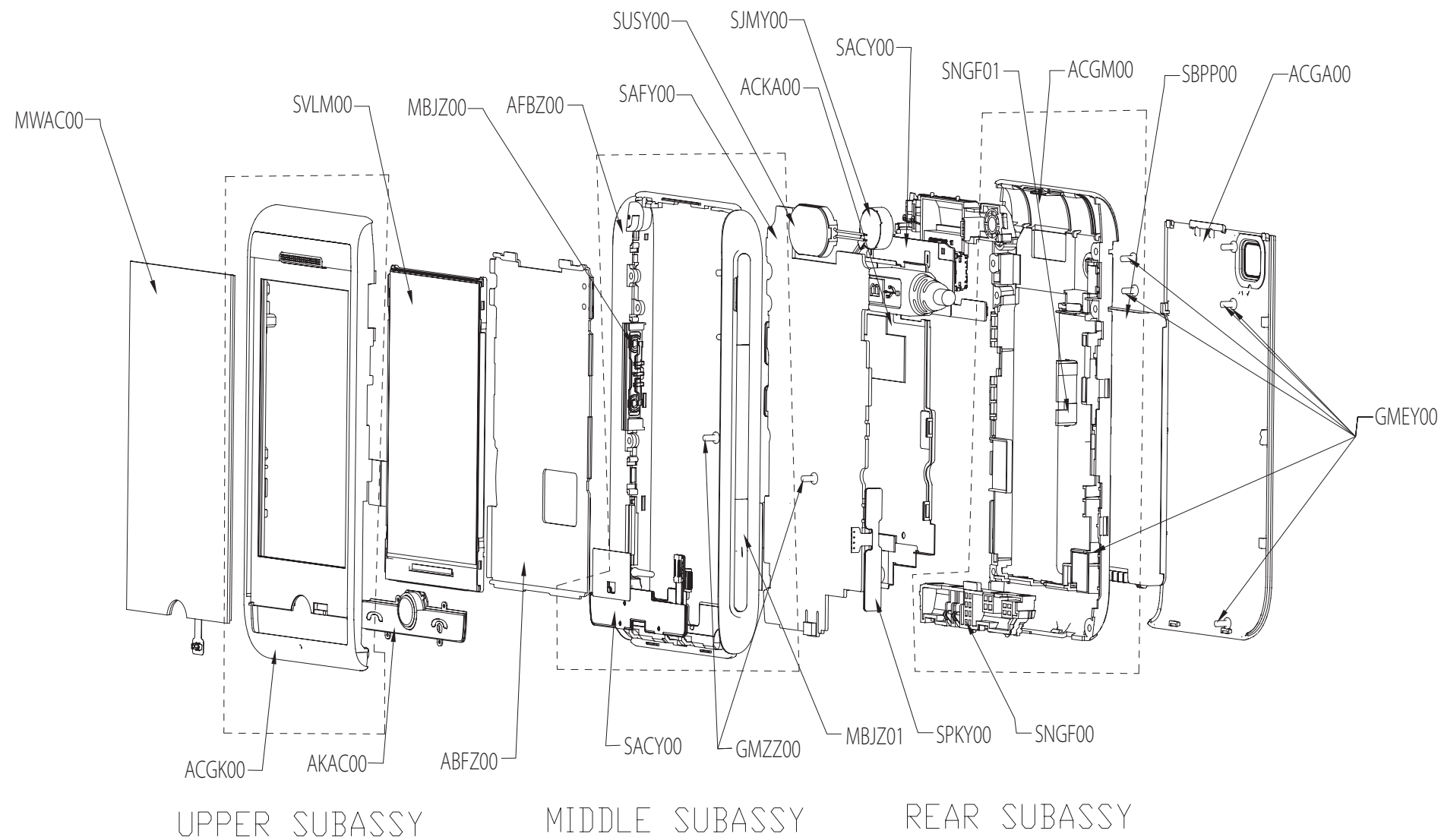
| DESCRIPTION | LOCATION.NO |
|---|---|
| GX500_SHIELD_CAN | ACKA00 |
| GX500_WI_FI | SNGF01 |
| GX500_INTENNA_BTM | SNGF00 |
| GX500_CAMERA_KEY | MBJZ01 |
| GX500_SCREW | GMEY00 |
| GX500_PCB | SAFY00 |
| GX500_SCREW | GMZZ00 |
| GX500_VIBRATOR | SJMY00 |
| GX500_TOUCH_WINDOW | MWAC00 |
| GX500_SPEAKER | SUSY00 |
| GX500_SUB_PCB | SACY00 |
| GX500_SEND_END_KEY | AKAC00 |
| GX500_LCD_FRAME_BTM_ASSY | ABFZ00 |
| GX500_LCD | SVLM00 |
| GX500_SIDE_KEY_FPCB | SPKY00 |
| GX500_VOL_KEY | MBJZ00 |
| GX500_COVER_UPPER | ACGK00 |
| GX500_COVER_REAR | ACGM00 |
| GX500_COVER_MIDDLE | AFBZ00 |
| GX500_COVER_BATTERY | ACGA00 |
| GX500_KEY_PCB | SACY00 |
| GX500_BATTERY | SBPP00 |
| DESCRIPTION | LOCATION.NO |

## 13.2 Replacement Parts
### <Mechanic component>

**Note**: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 1 | | GSM,BAR/FILP | TGSM0077102 | | BLACK | |
| 2 | AAAY | ADDITION | AAAY0460209 | | BLACK | |
| 3 | ACGA00 | COVER ASSY,BATTERY | ACGA0036601 | | BLACK | |
| 4 | MCJA00 | COVER,BATTERY | MCJA0105401 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 4 | MDAY00 | DECO | MDAY0056701 | ELECTROFORMING, Cu, , , , , | WITHOUT COLOR | |
| 3 | MLAZ00 | LABEL | MLAZ0050901 | PRINTING, (empty), , , , , | WITHOUT COLOR | |
| 2 | APEY | PHONE | APEY0886706 | | BLACK | |
| 3 | ACGY00 | COVER ASSY,EMS | ACGY0013806 | | BLACK | |
| 4 | 000 | ANTENNA,GSM,FIXED | SNGF0057001 | 3.0 ,-2.0 dBd,, ,internal, GSM900/1800/1900 ,; ,TRIPLE ,-5.0 ,50 ,3.0 | | |
| 4 | ACGM | COVER ASSY,REAR | ACGM0151101 | | BLACK | |
| 5 | 000 | PAD | MPBZ0266704 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MCCF00 | CAP,MOBILE SWITCH | MCCF0068001 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 5 | MCJN00 | COVER,REAR | MCJN0116001 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 5 | MLEY00 | LOCKER | MLEY0004801 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 5 | MPBT00 | PAD,CAMERA | MPBT0089201 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MPBU00 | PAD,CONNECTOR | MPBU0092801 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MPBZ00 | PAD | MPBZ0266701 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MTAK00 | TAPE,CAMERA | MTAK0035301 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MWAE00 | WINDOW,CAMERA | MWAE0057001 | CUTTING, PMMA MR 200, , , , , | BLACK | |
| 4 | ACGV | COVER ASSY,BAR | ACGV0014102 | TAPE PROTECTION CHANGE CIS->OPEN | BLACK | |
| 5 | ABFZ00 | BRACKET ASSY | ABFZ0022601 | | WITHOUT COLOR | |
| 6 | MFEZ00 | FRAME | MFEZ0025701 | PRESS, STS, , , , , | WITHOUT COLOR | |
| 6 | MTAZ00 | TAPE | MTAZ0281801 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MTAZ01 | TAPE | MTAZ0311401 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |

LGE Internal Use Only

# 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|-------|-------------|-------------|-------------|------|-------|--------|
| 5 | ACGK00 | COVER ASSY,FRONT | ACGK0152801 | | BLACK | |
| 6 | MCJK00 | COVER,FRONT | MCJK0121601 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MDAY00 | DECO | MDAY0056301 | PRESS, STS, , , , , | WITHOUT COLOR | |
| 6 | MDAY01 | DECO | MDAY0056201 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MFBZ00 | FILTER | MFBZ0010901 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MFBZ01 | FILTER | MFBZ0015001 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MICE00 | INSERT,NUT | MICE0014101 | PRESS, STS, , , , , | WITHOUT COLOR | |
| 6 | MPBG00 | PAD,LCD | MPBG0104801 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MPBJ00 | PAD,MOTOR | MPBJ0075802 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MPBZ00 | PAD | MPBZ0297001 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MTAA00 | TAPE,DECO | MTAA0214001 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MTAA01 | TAPE,DECO | MTAA0213901 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MTAD00 | TAPE,WINDOW | MTAD0121101 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | AFBZ00 | FRAME ASSY | AFBZ0017401 | | BLACK | |
| 6 | ACFA | CONTACT ASSY,SIDE BUTTON | ACFA0000302 | 2Button Type | WITHOUT COLOR | |
| 6 | MBJZ00 | BUTTON | MBJZ0021901 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MBJZ01 | BUTTON | MBJZ0021801 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MCCG00 | CAP,MULTIMEDIA CARD | MCCG0024201 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MCCZ00 | CAP | MCCZ0036201 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MDAY00 | DECO | MDAY0056601 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MDAY01 | DECO | MDAY0056401 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MDAY02 | DECO | MDAY0056501 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MFEZ00 | FRAME | MFEZ0025601 | MOLD, PC LUPOY SC-1004A, , , , , | BLACK | |
| 6 | MGDZ00 | GUIDE | MGDZ0000601 | PRESS, STS, , , , , | WITHOUT COLOR | |
| 6 | MTAB00 | TAPE,PROTECTION | MTAB0371301 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MTAZ00 | TAPE | MTAZ0281601 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 5 | AKAC00 | KEYPAD ASSY,MAIN | AKAC0007301 | SEND, END | BLACK | |
| 5 | GMZZ00 | SCREW MACHINE | GMZZ0019005 | 3.5 mm,1.5 mm,MSWR3 ,N ,+ ,- ,NYLOK Coating , , , , , , , , , | WITHOUT COLOR | |
| 5 | MPBZ00 | PAD | MPBZ0292901 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MTAB00 | TAPE,PROTECTION | MTAB0394602 | COMPLEX, (empty), , , , , | | |
| 5 | MTAZ01 | TAPE | MTAZ0311501 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MTAZ02 | TAPE | MTAZ0311601 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MWAC00 | WINDOW,LCD | MWAC0135201 | CUTTING, PMMA MR 200, , , , , | BLACK | |
| 7 | ADCA00 | DOME ASSY,METAL | ADCA0110501 | | WITHOUT COLOR | |
| 4 | ACKA00 | CAN ASSY,SHIELD | ACKA0024201 | | WITHOUT COLOR | |
| 5 | MCBA00 | CAN,SHIELD | MCBA0066501 | PRESS, STS, , , , , | WITHOUT COLOR | |
| 5 | MLAB | LABEL,A/S | MLAB0001102 | C2000 USASV DIA 4.0 | WHITE | |
| 5 | MLAZ00 | LABEL | MLAZ0054301 | PRINTING, (empty), , , , , | WITHOUT COLOR | |
| 5 | MPBZ00 | PAD | MPBZ0266703 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MPBZ01 | PAD | MPBZ0266702 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 5 | MTAZ00 | TAPE | MTAZ0282201 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 4 | GMEY | SCREW MACHINE,BIND | GMEY0007902 | 1.4 mm,4.5 mm,MSWR3 ,A ,ETC , ,; ,CS ,+ ,2.5 ,4.5 ,SWRH ,BLACK ,PLAIN ,A | BLACK | |
| 4 | MLAZ00 | LABEL | MLAZ0038303 | PRINTING, (empty), , , , , | White | |
| 4 | MTAZ00 | TAPE | MTAZ0311602 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 6 | MLAZ00 | LABEL | MLAZ0038301 | PID Label 4 Array | WITHOUT COLOR | |
| 3 | MLAA00 | LABEL,APPROVAL | MLAA0062304 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |

## 13.2 Replacement Parts
### \<Main component\>

**Note**: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 4 | 0000 | CAMERA | SVCY0024701 | CMOS ,MEGA ,3M FF SS-LSI(1/5"), 7x7x4.1t,Socket | | |
| 5 | 111 | ANTENNA,GSM,FIXED | SNGF0057103 | 3.0 ,-5.0 dBd,, ,internal, GSM850/GSM901/DCS/PCS ,; ,QUAD ,-5.0 ,50 ,3.0 | | |
| 5 | SNGF01 | ANTENNA,GSM,FIXED | SNGF0058502 | 3.0 ,-5.0 dBd,, ,internal, BT/WiFi ,; ,SINGLE ,-5.0 ,50 ,3.0 | | |
| 5 | SACY00 | PCB ASSY,FLEXIBLE | SACY0109101 | | | |
| 6 | SACB00 | PCB ASSY, FLEXIBLE,INSERT | SACB0062101 | | | |
| 6 | SACE00 | PCB ASSY,FLEXIBLE,SMT | SACE0098801 | | | |
| 7 | SACC00 | PCB ASSY,FLEXIBLE,SMT BOTTOM | SACC0073201 | | | |
| 8 | CN102 | CONNECTOR,BOARD TO BOARD | ENBY0052001 | 10 , mm,STRAIGHT , , ,; , ,0.40MM ,[empty] ,FEMALE ,[empty] ,[empty] , , | | |
| 7 | SACD00 | PCB ASSY,FLEXIBLE,SMT TOP | SACD0086201 | | | |
| 8 | CN101 | CONNECTOR,BOARD TO BOARD | ENBY0053501 | 20 , mm,STRAIGHT , , ,; , ,0.40MM ,[empty] ,MALE ,[empty] ,[empty] , , | | |
| 6 | SPCY | PCB,FLEXIBLE | SPCY0212301 | POLYI ,0.4 mm,MULTI-3 , ,; , , , , , , , , , | | |
| 5 | SVLM00 | LCD MODULE | SVLM0035201 | Main ,3.0 inch ,240*400 ,43.08*75.4*1.8t ,262K ,TFT ,TM ,S6D14E0 , , | | |
| 4 | SACY | PCB ASSY,FLEXIBLE | SACY0110701 | | | |
| 5 | SACB00 | PCB ASSY, FLEXIBLE,INSERT | SACB0062601 | | | |
| 5 | SACE00 | PCB ASSY,FLEXIBLE,SMT | SACE0100101 | | | |
| 6 | SACC00 | PCB ASSY,FLEXIBLE,SMT BOTTOM | SACC0074201 | | | |
| 7 | BAT101 | MODULE,ETC | SMZY0023501 | 3.8 Backup Capacitor 0.03F ,; ,Module Assembly | | |
| 7 | C101 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C102 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C103 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C105 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C109 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C110 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C112 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | CN101 | CONNECTOR,BOARD TO BOARD | ENBY0035901 | 40 PIN,0.4 mm,ETC , ,H=1.0, Plug | | |
| 7 | FB101 | FILTER,BEAD,CHIP | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead | | |
| 7 | FB102 | FILTER,BEAD,CHIP | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead | | |
| 7 | R109 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R110 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 7 | S101 | CONN,SOCKET | ENSY0022201 | 24 ,ETC , , mm,7*7, 1.3M (1/5") Socket Type | | |
| 7 | S102 | CONN,SOCKET | ENSY0025301 | 12 ,ETC , ,1.27 mm,28.5x15.5x3.9t, Tray Type Side Dual SIM socket | | |
| 7 | U104 | IC | EUSY0407401 | WDFN8L ,8 ,R/TP ,Programmable Dual LDO ,; ,IC,LDO Voltage Regulator | | |
| 6 | SACD00 | PCB ASSY,FLEXIBLE,SMT TOP | SACD0087201 | | | |
| 7 | C106 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C111 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | R112 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 7 | R113 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 6 | SPCY00 | PCB,FLEXIBLE | SPCY0225601 | POLYI ,0.4 mm,BUILD-UP 4 , ,; , , , , , , , , , | | |
| 4 | SAFY | PCB ASSY,MAIN | SAFY0377501 | | | |
| 5 | SAFB | PCB ASSY,MAIN,INSERT | SAFB0110801 | | | |
| 6 | SJMY00 | VIBRATOR,MOTOR | SJMY0008513 | 2 V, A,10*3.6 ,175hz linear 17mm ,; ,3V , , , , , , , | | |
| 6 | SPKY | PCB,SIDEKEY | SPKY0082101 | POLYI ,0.18 mm,DOUBLE , ,; , , , , , , , , , | | |
| 6 | SUSY00 | SPEAKER | SUSY0028901 | ASSY ,8 ohm,90 dB,1812 mm,3.0T 10mm ,; , , , , , , ,[empty] | | |
| 5 | SAFF | PCB ASSY,MAIN,SMT | SAFF0279301 | | | |
| 6 | SAFC | PCB ASSY,MAIN,SMT BOTTOM | SAFC0140601 | | | |
| 7 | C307 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C311 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C316 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C317 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C318 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C320 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C321 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C501 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | C536 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C537 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | FB301 | FILTER,BEAD,CHIP | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead | | |
| 7 | L303 | INDUCTOR,CHIP | ELCH0005009 | 100 nH,J ,1005 ,R/TP , | | |
| 7 | L304 | INDUCTOR,CHIP | ELCH0005009 | 100 nH,J ,1005 ,R/TP , | | |
| 7 | L501 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L506 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | MIC301 | MICROPHONE | SUMY0010609 | UNIT ,-42 dB,3.76*2.95*1.1 ,mems smd mic ,; , , ,OMNI ,[empty] , ,[empty] | | |
| 7 | R307 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R326 | PCB ASSY,MAIN,PAD SHORT | SAFP0000501 | | | |
| 7 | U304 | IC | EUSY0340301 | uMLP ,10 PIN,R/TP ,typ Rdson 0.4ohm, 1.4X1.8 ,; ,IC,Analog Switch | | |
| 7 | U307 | IC | EUSY0407501 | SSON004 ,4 ,R/TP ,1.8V 150mA Single LDO ,; ,IC,LDO Voltage Regulator | | |
| 7 | VA301 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA302 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 6 | SAFD | PCB ASSY,MAIN,SMT TOP | SAFD0138301 | | | |
| 7 | C101 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C102 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C103 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C104 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C105 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C106 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C107 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C108 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C109 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C110 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C111 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C112 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C113 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C114 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C115 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | C116 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C117 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C118 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C119 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C120 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C121 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C122 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C123 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C124 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C125 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C126 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C127 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C128 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C129 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C130 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C131 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C132 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C133 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C134 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C135 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C136 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C137 | CAP,CHIP,MAKER | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C138 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C139 | CAP,CERAMIC,CHIP | ECCH0000179 | 22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 7 | C140 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C141 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C142 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C143 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C144 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C145 | CAP,CERAMIC,CHIP | ECCH0000179 | 22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 7 | C146 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C147 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | C148 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C149 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C201 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C202 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C203 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C204 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C205 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C206 | CAP,TANTAL,CHIP | ECTH0005702 | 100 uF,6.3V ,M ,L_ESR ,3216 ,R/TP ,; , ,[empty] ,[empty] , ,[empty] , ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C207 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C208 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C209 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C210 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C211 | CAP,CERAMIC,CHIP | ECCH0000110 | 10 pF,50V,D,NP0,TC,1005,R/TP | | |
| 7 | C212 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C213 | CAP,CHIP,MAKER | ECZH0025502 | 22000000 pF,6.3V ,M ,X5R ,HD ,2012 ,R/TP ,; ,0.85t ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C214 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C215 | CAP,CERAMIC,CHIP | ECCH0005603 | 2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 7 | C216 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C217 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C218 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C219 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C220 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C221 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C222 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C223 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C224 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C225 | CAP,CERAMIC,CHIP | ECCH0007803 | 10 uF,10V ,M ,X5R ,HD ,1608 ,R/TP ,; , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C226 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |

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| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|-------|--------------|-------------|-------------|------|-------|--------|
| 7 | C227 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C228 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C229 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C230 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C232 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C233 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C234 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C235 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C236 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C237 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C238 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C239 | CAP,CERAMIC,CHIP | ECCH0000110 | 10 pF,50V,D,NP0,TC,1005,R/TP | | |
| 7 | C240 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C241 | CAP,CERAMIC,CHIP | ECCH0007803 | 10 uF,10V ,M ,X5R ,HD ,1608 ,R/TP ,; , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C242 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C243 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C244 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C245 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C246 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C247 | CAP,CERAMIC,CHIP | ECCH0005603 | 2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 7 | C248 | CAP,CERAMIC,CHIP | ECCH0000179 | 22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 7 | C249 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C250 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C251 | CAP,CHIP,MAKER | ECZH0001120 | 3.9 nF,50V ,K ,X7R ,HD ,1005 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C252 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C253 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C254 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C255 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C256 | CAP,CERAMIC,CHIP | ECCH0002002 | 47000 pF,10V ,K ,B ,HD ,1005 ,R/TP | | |
| 7 | C301 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|-------|--------------|-------------|-------------|------|-------|--------|
| 7 | C302 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C303 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C304 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C305 | CAP,CERAMIC,CHIP | ECCH0000179 | 22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 7 | C306 | CAP,CERAMIC,CHIP | ECCH0000179 | 22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 7 | C310 | CAP,CHIP,MAKER | ECZH0003503 | 1 uF,25V ,K ,X5R ,HD ,1608 ,R/TP | | |
| 7 | C312 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C313 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C314 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C315 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C319 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C324 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C325 | CAP,CERAMIC,CHIP | ECCH0000129 | 120 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C326 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C327 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C328 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C329 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C330 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C331 | CAP,CHIP,MAKER | ECZH0003504 | 100 nF,25V ,K ,X7R ,HD ,1608 ,R/TP | | |
| 7 | C332 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C333 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C334 | CAP,CERAMIC,CHIP | ECCH0000110 | 10 pF,50V,D,NP0,TC,1005,R/TP | | |
| 7 | C336 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C337 | CAP,CHIP,MAKER | ECZH0003503 | 1 uF,25V ,K ,X5R ,HD ,1608 ,R/TP | | |
| 7 | C338 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C405 | INDUCTOR,CHIP | ELCH0001412 | 1.8 nH,S ,1005 ,R/TP ,PBFREE | | |
| 7 | C406 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 7 | C407 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C408 | CAP,CERAMIC,CHIP | ECCH0000901 | 2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C409 | CAP,CHIP,MAKER | ECZH0000839 | 4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C410 | INDUCTOR,CHIP | ELCH0003819 | 12 nH,J ,1005 ,R/TP , | | |
| 7 | C411 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | C412 | CAP,CHIP,MAKER | ECZH0000839 | 4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C413 | CAP,CHIP,MAKER | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C414 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C415 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C416 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C417 | INDUCTOR,CHIP | ELCH0003839 | 22 nH,J ,1005 ,R/TP ,MLCI | | |
| 7 | C418 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C419 | CAP,CERAMIC,CHIP | ECCH0002002 | 47000 pF,10V ,K ,B ,HD ,1005 ,R/TP | | |
| 7 | C420 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C421 | CAP,CERAMIC,CHIP | ECCH0000180 | 3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C422 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C423 | CAP,CERAMIC,CHIP | ECCH0000151 | 4.7 nF,25V,K,X7R,HD,1005,R/TP | | |
| 7 | C424 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C425 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C426 | CAP,CERAMIC,CHIP | ECCH0000180 | 3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C427 | CAP,CERAMIC,CHIP | ECCH0000184 | 2.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C428 | CAP,CHIP,MAKER | ECZH0001002 | 0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C429 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C430 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C431 | CAP,CERAMIC,CHIP | ECCH0000184 | 2.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C432 | CAP,CERAMIC,CHIP | ECCH0000280 | 0.22 uF,10V ,K ,X7R ,HD ,1608 ,R/TP | | |
| 7 | C433 | INDUCTOR,CHIP | ELCH0004705 | 8.2 nH,J ,1005 ,R/TP , | | |
| 7 | C434 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C435 | CAP,CERAMIC,CHIP | ECCH0000901 | 2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C436 | INDUCTOR,CHIP | ELCH0001052 | 18 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | C437 | CAP,TANTAL,CHIP | ECTH0002002 | 33 uF,10V ,M ,L_ESR ,2012 ,R/TP ,; , ,[empty] ,[empty] , ,-55TO+125C , ,2.2X1.1X1.1MM ,[empty] ,[empty] ,[empty] | | |
| 7 | C438 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C439 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C440 | CAP,CHIP,MAKER | ECZH0000802 | 1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C441 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C442 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | C502 | CAP,CHIP,MAKER | ECZH0004402 | 0.1 uF,16V ,Z ,X7R ,TC ,1005 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C503 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C504 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C505 | CAP,CHIP,MAKER | ECZH0004402 | 0.1 uF,16V ,Z ,X7R ,TC ,1005 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C506 | CAP,CERAMIC,CHIP | ECCH0007803 | 10 uF,10V ,M ,X5R ,HD ,1608 ,R/TP ,; , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C507 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C508 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C509 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C510 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C511 | CAP,CHIP,MAKER | ECZH0004402 | 0.1 uF,16V ,Z ,X7R ,TC ,1005 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C512 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C513 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C514 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C515 | CAP,CHIP,MAKER | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C516 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C517 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C518 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C519 | CAP,CHIP,MAKER | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C520 | CAP,CERAMIC,CHIP | ECCH0007803 | 10 uF,10V ,M ,X5R ,HD ,1608 ,R/TP ,; , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C521 | CAP,CERAMIC,CHIP | ECCH0005603 | 2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 7 | C522 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C523 | CAP,CHIP,MAKER | ECZH0025502 | 22000000 pF,6.3V ,M ,X5R ,HD ,2012 ,R/TP ,; ,0.85t ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C524 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C525 | CAP,CHIP,MAKER | ECZH0004402 | 0.1 uF,16V ,Z ,X7R ,TC ,1005 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C526 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C527 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C528 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C529 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C530 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | C531 | CAP,CERAMIC,CHIP | ECCH0005603 | 2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 7 | C532 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C533 | CAP,CHIP,MAKER | ECZH0004402 | 0.1 uF,16V ,Z ,X7R ,TC ,1005 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C534 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C535 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C538 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C539 | CAP,CHIP,MAKER | ECZH0001503 | 0.47 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP | | |
| 7 | C540 | CAP,CHIP,MAKER | ECZH0025502 | 22000000 pF,6.3V ,M ,X5R ,HD ,2012 ,R/TP ,; ,0.85t ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |
| 7 | C541 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C542 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C543 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C544 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C545 | CAP,CHIP,MAKER | ECZH0001217 | 470 nF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C546 | CAP,CHIP,MAKER | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C547 | CAP,CHIP,MAKER | ECZH0001217 | 470 nF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C606 | CAP,CHIP,MAKER | ECZH0000802 | 1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C611 | CAP,CERAMIC,CHIP | ECCH0000184 | 2.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C612 | INDUCTOR,CHIP | ELCH0004706 | 10 nH,J ,1005 ,R/TP , | | |
| 7 | C613 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C614 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 7 | C615 | CAP,CERAMIC,CHIP | ECCH0000195 | 3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C616 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C617 | CAP,CHIP,MAKER | ECZH0000839 | 4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C618 | CAP,CERAMIC,CHIP | ECCH0000701 | 1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C619 | CAP,CERAMIC,CHIP | ECCH0006201 | 4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 7 | C620 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C622 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C623 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C627 | CAP,CERAMIC,CHIP | ECCH0000180 | 3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C628 | CAP,CERAMIC,CHIP | ECCH0000180 | 3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C629 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|-------|--------------|-------------|-------------|------|-------|--------|
| 7 | C630 | CAP,CHIP,MAKER | ECZH0000839 | 4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C631 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C632 | INDUCTOR,CHIP | ELCH0001401 | 15 nH,J ,1005 ,R/TP ,Pb Free | | |
| 7 | C633 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C635 | CAP,CERAMIC,CHIP | ECCH0000901 | 2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C636 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C637 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C639 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C640 | CAP,TANTAL,CHIP | ECTH0002002 | 33 uF,10V ,M ,L_ESR ,2012 ,R/TP ,; , ,[empty] ,[empty] , ,-55TO+125C , ,2.2X1.1X1.1MM ,[empty] ,[empty] ,[empty] | | |
| 7 | C641 | CAP,CERAMIC,CHIP | ECCH0000196 | 0.75 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C642 | CAP,CERAMIC,CHIP | ECCH0000195 | 3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C643 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C644 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C645 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 7 | C646 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C647 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C687 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C688 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C689 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C691 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C692 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C693 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C694 | CAP,CERAMIC,CHIP | ECCH0006201 | 4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 7 | C695 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C696 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C697 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C698 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C699 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C701 | CAP,CERAMIC,CHIP | ECCH0007803 | 10 uF,10V ,M ,X5R ,HD ,1608 ,R/TP ,; , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C702 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | C703 | CAP,CHIP,MAKER | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C704 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C705 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C706 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C707 | CAP,CHIP,MAKER | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C708 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C709 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C710 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C711 | CAP,CERAMIC,CHIP | ECCH0000117 | 27 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C712 | CAP,CHIP,MAKER | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C713 | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C714 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C715 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C716 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 7 | C717 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C718 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C719 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C720 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C804 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C805 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C806 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C807 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C808 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C809 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C810 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C811 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | C812 | CAP,CHIP,MAKER | ECZH0001126 | 820 pF,50V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 7 | C813 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C817 | CAP,CHIP,MAKER | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 7 | C819 | CAP,CERAMIC,CHIP | ECCH0005604 | 10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm | | |
| 7 | C820 | CAP,CHIP,MAKER | ECZH0004402 | 0.1 uF,16V ,Z ,X7R ,TC ,1005 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] | | |

# 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | CN201 | CONNECTOR,ETC | ENZY0022101 | 3 ,2.5 mm,ETC , , | | |
| 7 | CN301 | CONNECTOR,I/O | ENRY0008801 | 5 , mm,ANGLE , , ,; , ,0.64MM ,ANGLE ,[empty] ,DIP ,[empty] , | | |
| 7 | CN601 | CONNECTOR,ETC | ENZY0023801 | 10 , mm,STRAIGHT , , | | |
| 7 | CN602 | CONNECTOR,ETC | ENZY0023801 | 10 , mm,STRAIGHT , , | | |
| 7 | CN802 | CONNECTOR,BOARD TO BOARD | ENBY0036001 | 40 PIN,0.4 mm,ETC , ,H=1.0, Socket | | |
| 7 | CN804 | CONNECTOR,BOARD TO BOARD | ENBY0036001 | 40 PIN,0.4 mm,ETC , ,H=1.0, Socket | | |
| 7 | CN805 | CONNECTOR,BOARD TO BOARD | ENBY0053601 | 20 , mm,STRAIGHT , , ,; , ,0.40MM ,[empty] ,FEMALE ,[empty] ,[empty] , , | | |
| 7 | D201 | DIODE,SWITCHING | EDSY0011901 | EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V) | | |
| 7 | D202 | DIODE,SWITCHING | EDSY0011901 | EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V) | | |
| 7 | D501 | DIODE,SWITCHING | EDSY0011901 | EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V) | | |
| 7 | D502 | DIODE,SWITCHING | EDSY0011901 | EMD2 ,30 V,1 A,R/TP ,VF=1.5V(IF=200mA) , IR=30uA(VR=10V) | | |
| 7 | FB201 | FILTER,BEAD,CHIP | SFBH0009201 | 220 ohm,1608 , | | |
| 7 | FB202 | FILTER,BEAD,CHIP | SFBH0009201 | 220 ohm,1608 , | | |
| 7 | FB302 | FILTER,BEAD,CHIP | SFBH0000912 | 1000 ohm,1005 , | | |
| 7 | FB303 | FILTER,BEAD,CHIP | SFBH0000912 | 1000 ohm,1005 , | | |
| 7 | FB304 | FILTER,BEAD,CHIP | SFBH0000912 | 1000 ohm,1005 , | | |
| 7 | FB601 | FILTER,BEAD,CHIP | SFBH0008101 | 600 ohm,1005 , | | |
| 7 | FB602 | FILTER,BEAD,CHIP | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead | | |
| 7 | FB701 | FILTER,BEAD,CHIP | SFBH0002302 | 120 ohm,1608 ,CHIP BEAD,  2000mA | | |
| 7 | FL1 | FILTER,SEPERATOR | SFAY0012001 | , , dB, dB, dB, dB,4532 ,IFX EDGE Quad Pin | | |
| 7 | FL101 | FILTER,EMI/POWER | SFEY0013701 | SMD ,18 V,4ch. EMI_ESD Filter (100 Ohm, 7.5pF) | | |
| 7 | FL102 | FILTER,EMI/POWER | SFEY0013701 | SMD ,18 V,4ch. EMI_ESD Filter (100 Ohm, 7.5pF) | | |
| 7 | FL201 | FILTER,EMI/POWER | SFEY0006501 | SMD ,3 TERMINAL EMI FILTER | | |
| 7 | FL301 | FILTER,EMI/POWER | SFEY0006501 | SMD ,3 TERMINAL EMI FILTER | | |
| 7 | FL401 | FILTER,SEPERATOR | SFAY0012001 | , , dB, dB, dB, dB,4532 ,IFX EDGE Quad Pin | | |
| 7 | FL801 | FILTER,EMI/POWER | SFEY0015501 | SMD ,Pb-free_4ch_5p-100ohm-5p ,; ,Filter,LCR | | |
| 7 | FL802 | FILTER,EMI/POWER | SFEY0015501 | SMD ,Pb-free_4ch_5p-100ohm-5p ,; ,Filter,LCR | | |
| 7 | FL803 | FILTER,EMI/POWER | SFEY0013201 | SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | FL804 | FILTER,EMI/POWER | SFEY0013201 | SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm | | |
| 7 | FL805 | FILTER,EMI/POWER | SFEY0013201 | SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm | | |
| 7 | L101 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L102 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L103 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L104 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L201 | INDUCTOR,SMD,POWER | ELCP0006811 | 10 uH,M ,3.8*3.8*1.3 ,R/TP ,power inductor 750mA ,; ,10uH ,20% ,. ,750mA ,0.28 ,; ,; ,SHIELD ,3.8X3.8X1.3MM ,[empty] ,[empty] ,Inductor,Wire Wound,Chip | | |
| 7 | L202 | INDUCTOR,SMD,POWER | ELCP0006703 | 10 uH,M ,3.2*2.6*1.0 ,R/TP , | | |
| 7 | L203 | INDUCTOR,CHIP | ELCH0001444 | 100 nH,J ,1005 ,R/TP ,chip coil | | |
| 7 | L204 | INDUCTOR,CHIP | ELCH0001444 | 100 nH,J ,1005 ,R/TP ,chip coil | | |
| 7 | L301 | INDUCTOR,CHIP | ELCH0005009 | 100 nH,J ,1005 ,R/TP , | | |
| 7 | L305 | INDUCTOR,CHIP | ELCH0005009 | 100 nH,J ,1005 ,R/TP , | | |
| 7 | L306 | INDUCTOR,CHIP | ELCH0001444 | 100 nH,J ,1005 ,R/TP ,chip coil | | |
| 7 | L401 | INDUCTOR,CHIP | ELCH0012510 | 15 nH,G ,1005 ,R/TP ,chip coil | | |
| 7 | L402 | INDUCTOR,CHIP | ELCH0009113 | 4.7 nH,J ,1005 ,R/TP ,chip coil | | |
| 7 | L403 | CAP,CHIP,MAKER | ECZH0000824 | 20 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | L404 | CAP,CHIP,MAKER | ECZH0000839 | 4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | L405 | INDUCTOR,CHIP | ELCH0001401 | 15 nH,J ,1005 ,R/TP ,Pb Free | | |
| 7 | L406 | CAP,CERAMIC,CHIP | ECCH0000195 | 3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | L407 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L408 | INDUCTOR,CHIP | ELCH0003814 | 5.1 nH,S ,1005 ,R/TP ,5.1nH,1005 | | |
| 7 | L502 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L504 | INDUCTOR,SMD,POWER | ELCP0006703 | 10 uH,M ,3.2*2.6*1.0 ,R/TP , | | |
| 7 | L507 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L509 | INDUCTOR,SMD,POWER | ELCP0006703 | 10 uH,M ,3.2*2.6*1.0 ,R/TP , | | |
| 7 | L601 | INDUCTOR,CHIP | ELCH0001430 | 100 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L602 | INDUCTOR,CHIP | ELCH0001404 | 1.5 nH,S,1005,R/TP | | |
| 7 | L603 | INDUCTOR,CHIP | ELCH0009113 | 4.7 nH,J ,1005 ,R/TP ,chip coil | | |
| 7 | L604 | INDUCTOR,CHIP | ELCH0003831 | 1 nH,S ,1005 ,R/TP ,MLCI | | |
| 7 | L605 | INDUCTOR,CHIP | ELCH0009120 | 4.3 nH,J ,1005 ,R/TP ,COIL | | |

# 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|-------|--------------|-------------|-------------|------|-------|--------|
| 7 | L607 | INDUCTOR,SMD,POWER | ELCP0008007 | 3.3 uH,N ,2.5*2.0*1.0 ,R/TP ,MLCI Power ,; ,3.3 ,30% ,; ,; ,; ,; ,; ,; ,SHIELD ,2.5X2X1MM ,[empty] ,[empty] ,Inductor,Wire Wound,Chip | | |
| 7 | L608 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | L609 | INDUCTOR,CHIP | ELCH0004706 | 10 nH,J ,1005 ,R/TP , | | |
| 7 | L611 | CAP,CHIP,MAKER | ECZH0000806 | 5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | L612 | INDUCTOR,CHIP | ELCH0012510 | 15 nH,G ,1005 ,R/TP ,chip coil | | |
| 7 | L699 | INDUCTOR,SMD,POWER | ELCP0008004 | 4.7 uH,M ,1 ,R/TP , ,; , ,0.3NH , , , , , ,NON SHIELD ,2.5X2X1MM ,11MM ,R/TP | | |
| 7 | L701 | FILTER,BEAD,CHIP | SFBH0008105 | 1800 ohm,1005 ,Chip bead ,; ,1800ohm ,; ,[empty] ,R/TP | | |
| 7 | L702 | FILTER,BEAD,CHIP | SFBH0008105 | 1800 ohm,1005 ,Chip bead ,; ,1800ohm ,; ,[empty] ,R/TP | | |
| 7 | L703 | INDUCTOR,CHIP | ELCH0001421 | 47 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | L704 | INDUCTOR,CHIP | ELCH0001421 | 47 nH,J ,1005 ,R/TP ,PBFREE | | |
| 7 | PT401 | THERMISTOR | SETY0006301 | NTC ,10000 ohm,SMD ,1005, 3350~3399k, J, R/T, PBFREE | | |
| 7 | PT601 | THERMISTOR | SETY0006301 | NTC ,10000 ohm,SMD ,1005, 3350~3399k, J, R/T, PBFREE | | |
| 7 | Q201 | TR,BJT,NPN | EQBN0013701 | EMT6 ,150 mW,R/TP ,DUAL TRANSISTORS | | |
| 7 | Q501 | TR,BJT,NPN | EQBN0020501 | ESM ,0.15 W,R/TP , ,; ,NPN ,5V ,60V ,50V ,150mA ,0.1uA MAX ,10 MIN 700 MAX ,100mW ,ESM ,R/TP ,3P | | |
| 7 | R101 | RES,CHIP,MAKER | ERHZ0000465 | 3300 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R102 | RES,CHIP,MAKER | ERHZ0000244 | 22 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R103 | RES,CHIP,MAKER | ERHZ0000467 | 330 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R104 | RES,CHIP,MAKER | ERHZ0000441 | 22 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R105 | RES,CHIP,MAKER | ERHZ0000203 | 10 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R106 | RES,CHIP,MAKER | ERHZ0000529 | 1.5 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R107 | RES,CHIP,MAKER | ERHZ0000441 | 22 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R108 | RES,CHIP,MAKER | ERHZ0000203 | 10 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R109 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R110 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R111 | RES,CHIP | ERHY0000166 | 390 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R112 | RES,CHIP | ERHY0000150 | 75K ohm,1/16W,F,1005,R/TP | | |
| 7 | R113 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R114 | RES,CHIP,MAKER | ERHZ0000529 | 1.5 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R115 | RES,CHIP,MAKER | ERHZ0000434 | 1 ohm,1/16W ,J ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|-------|--------------|-------------|-------------|------|-------|--------|
| 7 | R116 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R117 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R118 | RES,CHIP,MAKER | ERHZ0000404 | 1 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R119 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R120 | RES,CHIP,MAKER | ERHZ0000404 | 1 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R201 | PCB ASSY,MAIN,PAD SHORT | SAFP0000501 | | | |
| 7 | R202 | PCB ASSY,MAIN,PAD SHORT | SAFP0000501 | | | |
| 7 | R203 | RES,CHIP,MAKER | ERHZ0000437 | 2 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R205 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 7 | R207 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 7 | R208 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 7 | R209 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R212 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R213 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R214 | RES,CHIP,MAKER | ERHZ0000404 | 1 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R216 | RES,CHIP | ERHY0000137 | 27K ohm,1/16W,F,1005,R/TP | | |
| 7 | R217 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R218 | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R219 | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R220 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R221 | RES,CHIP,MAKER | ERHZ0000301 | 560 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R223 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R224 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R225 | PCB ASSY,MAIN,PAD SHORT | SAFP0000501 | | | |
| 7 | R301 | RES,CHIP,MAKER | ERHZ0000463 | 33 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R302 | RES,CHIP,MAKER | ERHZ0000463 | 33 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R303 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 7 | R305 | RES,CHIP,MAKER | ERHZ0000404 | 1 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R306 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R308 | RES,CHIP,MAKER | ERHZ0000404 | 1 Kohm,1/16W ,J ,1005 ,R/TP | | |

# 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|-------|-------------|-------------|-------------|------|-------|--------|
| 7 | R309 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R310 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R311 | RES,CHIP,MAKER | ERHZ0000402 | 10 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R312 | RES,CHIP,MAKER | ERHZ0000402 | 10 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R313 | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R315 | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R318 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R319 | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R322 | RES,CHIP,MAKER | ERHZ0000267 | 3300 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R323 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R324 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R325 | RES,CHIP | ERHY0035501 | 750 ohm,1/16W ,F ,1005 ,R/TP ,; ,750 ,1% ,1/16W ,1005 ,R/TP | | |
| 7 | R401 | RES,CHIP,MAKER | ERHZ0000206 | 10 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R402 | RES,CHIP | ERHY0000185 | 820 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R403 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R404 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | R405 | RES,CHIP,MAKER | ERHZ0000402 | 10 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R406 | RES,CHIP,MAKER | ERHZ0000244 | 22 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R407 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | R501 | RES,CHIP,MAKER | ERHZ0000286 | 4700 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R502 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R503 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R505 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R506 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R507 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R508 | RES,CHIP,MAKER | ERHZ0000437 | 2 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R509 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R510 | RES,CHIP | ERHY0003201 | 1000 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R511 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R513 | RES,CHIP,MAKER | ERHZ0000206 | 10 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R514 | RES,CHIP,MAKER | ERHZ0000244 | 22 Kohm,1/16W ,F ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | R515 | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R516 | RES,CHIP,MAKER | ERHZ0000206 | 10 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R518 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R519 | RES,CHIP,MAKER | ERHZ0000441 | 22 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R520 | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R521 | RES,CHIP | ERHY0000166 | 390 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R522 | RES,CHIP | ERHY0003201 | 1000 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R523 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R524 | RES,CHIP,MAKER | ERHZ0000441 | 22 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R525 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R526 | RES,CHIP,MAKER | ERHZ0000201 | 100 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R527 | RES,CHIP,MAKER | ERHZ0000267 | 3300 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R528 | RES,CHIP,MAKER | ERHZ0000267 | 3300 ohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R601 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 7 | R602 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R603 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R604 | RES,CHIP,MAKER | ERHZ0000204 | 100 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R605 | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R606 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R607 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R702 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R703 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R704 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R705 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R706 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R707 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R708 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R709 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R711 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R799 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R802 | RES,CHIP | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R803 | RES,CHIP | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | R804 | RES,CHIP | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R805 | RES,CHIP | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R806 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R807 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R808 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R809 | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R811 | RES,CHIP,MAKER | ERHZ0000486 | 47 Kohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | R812 | RES,CHIP | ERHY0000275 | 56K ohm,1/16W,J,1005,R/TP | | |
| 7 | R814 | RES,CHIP,MAKER | ERHZ0000203 | 10 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R816 | RES,CHIP,MAKER | ERHZ0000203 | 10 Kohm,1/16W ,F ,1005 ,R/TP | | |
| 7 | R817 | PCB ASSY,MAIN,PAD OPEN | SAFO0000501 | 0OHM_1005_DNI | | |
| 7 | R818 | PCB ASSY,MAIN,PAD OPEN | SAFO0000501 | 0OHM_1005_DNI | | |
| 7 | R819 | PCB ASSY,MAIN,PAD SHORT | SAFP0000501 | | | |
| 7 | R820 | RES,CHIP,MAKER | ERHZ0000457 | 30 ohm,1/16W ,J ,1005 ,R/TP | | |
| 7 | S801 | CONN,SOCKET | ENSY0023301 | 8 ,ETC , ,0.7 mm,H=1.52,(15*15) | | |
| 7 | SAFY00 | PCB,MAIN | SPFY0216901 | FR-4 ,0.8 mm,STAGGERED-8 , ,;, , , , , , , , , , | | |
| 7 | SW401 | CONN,RF SWITCH | ENWY0008701 | STRAIGHT H=1.35 ,SMD , dB, ,; ,1.40MM ,STRAIGHT ,SOCKET ,SMD ,P/TR ,AU , , | | |
| 7 | SW602 | CONN,RF SWITCH | ENWY0008701 | STRAIGHT H=1.35 ,SMD , dB, ,; ,1.40MM ,STRAIGHT ,SOCKET ,SMD ,P/TR ,AU , , | | |
| 7 | U101 | IC | EUSY0322801 | BGA ,10 ,R/TP ,Multimedia Extension EDGE BB, 313 Ball , ,IC,Digital Baseband Processor | | |
| 7 | U102 | IC | EUSY0347505 | FBGA ,137 ,ETC ,FULLY 1.8V 2G(LB/128Mx16) NAND+1G(8Mx4x32) SDRAM ,; ,IC,MCP | | |
| 7 | U201 | IC | EUSY0323901 | BGA PG-WFSGA ,121 PIN,R/TP ,SMPOWER3 | | |
| 7 | U203 | IC | EUSY0360301 | ,8 ,R/TP ,3axis accelerometer lowcost ,; ,IC Assembly | | |
| 7 | U204 | IC | EUSY0200803 | MFL ,8 ,R/TP ,Haptic Driver IC,2X2 ,; ,IC,Motor Driver | | |
| 7 | U205 | IC | EUSY0344405 | QFN ,18 ,R/TP ,6CH,PWM,2X3 ,; ,IC,Charge Pump | | |
| 7 | U301 | IC | EUSY0347001 | MiniQFN-10L ,10 PIN,R/TP ,1.8X1.4X0.55,0.6 Dual SPDT Analog Switch ,; ,IC,Analog Switch | | |
| 7 | U302 | IC | EUSY0347001 | MiniQFN-10L ,10 PIN,R/TP ,1.8X1.4X0.55,0.6 Dual SPDT Analog Switch ,; ,IC,Analog Switch | | |
| 7 | U303 | IC | EUSY0340301 | uMLP ,10 PIN,R/TP ,typ Rdson 0.4ohm, 1.4X1.8 ,; ,IC,Analog Switch | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|-------|--------------|-------------|-------------|------|-------|--------|
| 7 | U305 | IC | EUSY0340301 | uMLP ,10 PIN,R/TP ,typ Rdson 0.4ohm, 1.4X1.8 ,; ,IC,Analog Switch | | |
| 7 | U308 | IC | EUSY0263301 | SC-88(2.0x2.1) ,6 PIN,R/TP ,Single SPDT Switch, Pb Free | | |
| 7 | U309 | IC | EUSY0372001 | WCSP ,20 ,R/TP ,MUIC ,; ,IC,Analog Switch | | |
| 7 | U310 | IC | EUSY0388501 | DFN ,10 ,R/TP ,Cal Test Mode Single Charger IC for Micro USB ,; ,IC,Charger | | |
| 7 | U401 | IC | EUSY0274801 | VQFN ,40 PIN,R/TP ,GPRS, EDGE TRANSCEIVER | | |
| 7 | U402 | PAM | SMPY0021101 | dBm, %, A, dBc, dB,5x5 ,SMD ,Linear EDGE PAM. 5005's Halogen Free ver. ,; , , , , , , , ,LGA ,R/TP , | | |
| 7 | U501 | IC | EUSY0102803 | MicroPak ,8 ,R/TP ,Dual AND gate ,; ,IC,TTL | | |
| 7 | U502 | IC | EUSY0389001 | FBGA ,107 ,ETC ,FULLY 1.8V 1G(LB/64Mx16) NAND+512M(8Mx4x16) SDRAM ,; ,IC,MCP | | |
| 7 | U503 | IC | EUSY0347801 | BGA ,293 PIN,R/TP ,EDGE RF BB PM Onechip BB ,; ,IC,Digital Baseband Processor | | |
| 7 | U601 | MODULE,ETC | SMZY0026201 | WiFi(b/g)+BT2.1+FM Rx, 9.0x7.8x1.1, 54pin (BCM4325D1) ,; ,WLAN | | |
| 7 | U602 | PAM | SMPY0021101 | dBm, %, A, dBc, dB,5x5 ,SMD ,Linear EDGE PAM. 5005's Halogen Free ver. ,; , , , , , , , ,LGA ,R/TP , | | |
| 7 | U603 | IC | EUSY0342401 | WQFN16 ,16 PIN,R/TP ,Dual DPDT Analog Switch ,; ,IC,Analog Switch | | |
| 7 | U604 | IC | EUSY0407401 | WDFN8L ,8 ,R/TP ,Programmable Dual LDO ,; ,IC,LDO Voltage Regulator | | |
| 7 | U701 | IC | EUSY0390501 | WLCSP ,20 ,R/TP , ,; ,IC,Audio Sub System | | |
| 7 | U702 | IC | EUSY0285602 | FBGA ,100 PIN,ETC ,128K DUAL PORT STATIC RAM / B-VER. MULTI IO / PB FREE | | |
| 7 | U703 | IC | EUSY0340301 | uMLP ,10 PIN,R/TP ,typ Rdson 0.4ohm, 1.4X1.8 ,; ,IC,Analog Switch | | |
| 7 | U802 | IC | EUSY0337101 | CSP ,12 PIN,R/TP ,Touchscreen Controller IC , ,IC,A/D Converter | | |
| 7 | VA201 | VARISTOR | SEVY0005201 | 5.5 V, ,SMD ,1005, 50pF | | |
| 7 | VA202 | VARISTOR | SEVY0005201 | 5.5 V, ,SMD ,1005, 50pF | | |
| 7 | VA203 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA204 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA205 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA701 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA702 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA801 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA802 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 7 | VA803 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA804 | VARISTOR | SEVY0001001 | 14 V, ,SMD ,50pF, 1005 | | |
| 7 | VA805 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA806 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA807 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA808 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA809 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA810 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA811 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA812 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | VA813 | VARISTOR | SEVY0003801 | 18 V, ,SMD , | | |
| 7 | X101 | X-TAL | EXXY0018701 | 32.768 KHz,20 PPM,12.5 pF,70 Kohm,SMD ,3.2*1.5*0.9 , | | |
| 7 | X401 | X-TAL | EXXY0027001 | 26 MHz,7 PPM,8 pF,40 ohm,SMD ,3.2*2.5*0.75 ,26MHz IFX ULC2 Ref. Clock, Pb-Free ,; ,26MHz ,[empty] ,3.6fF-Motion ,1.0pF-Shunt , ,SMD ,R/TP | | |
| 7 | X501 | X-TAL | EXXY0018701 | 32.768 KHz,20 PPM,12.5 pF,70 Kohm,SMD ,3.2*1.5*0.9 , | | |
| 7 | X502 | X-TAL | EXXY0027001 | 26 MHz,7 PPM,8 pF,40 ohm,SMD ,3.2*2.5*0.75 ,26MHz IFX ULC2 Ref. Clock, Pb-Free ,; ,26MHz ,[empty] ,3.6fF-Motion ,1.0pF-Shunt , ,SMD ,R/TP | | |
| 7 | X601 | TCXO | EXST0001901 | 26 MHz,2.5 PPM,10 pF,SMD ,32*15*1.0 ,TI_WL1251 ,; , ,2.5PPM ,2.8V , , , , ,SMD ,R/TP | | |

## 13.3 Accessory

**Note**: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

| Level | Location No. | Description | Part Number | Spec | Color | Remark |
|---|---|---|---|---|---|---|
| 3 | MHBY | HANDSTRAP | MHBY0004319 | COMPLEX, (empty), , , , , | WITHOUT COLOR | |
| 3 | SBPP00 | BATTERY PACK,LI-POLYMER | SBPP0027401 | 3.7 V,1500 mAh,1 CELL,PRISMATIC ,454261 WW LABEL ,; , , , ,PRISMATIC , , ,BLACK , , | GRAY | |
| 3 | SGDY00 | DATA CABLE | SGDY0014302 | ; ,[empty] ,[empty] ,1.2M , ,BLACK ,1.2m, 4, Shield case MicroUSB, ID resistor open ,N | | |
| 3 | SGEY00 | EAR PHONE/EAR MIKE SET | SGEY0003745 | ; ,RMS 20mW(0.56V,RMS) ,16Ohm+-2.4Ohm 1KHZ ,116dB+-3dB 1KHZ,3mW ,116dB 1KHZ ,96dB 100HZ ,[empty] ,BLACK ,PLUG ,GB190,5P,230Mesh ,Earphone,Stereo | | |
| 3 | SSAD00 | ADAPTOR,AC-DC | SSAD0034001 | 100-240V ,5060 Hz,5.1 V,0.7 A,CE ,AC-DC ADAPTOR ,; ,90Vac~264Vac ,5.1 ,700mA ,5060 , ,WALL 3P ,USB , | | |
| 3 | | ADAPTOR,AC-DC | SSAD0034002 | 100-240V ,5060 Hz,5.1 V,0.7 A,CE ,AC-DC ADAPTOR ,; ,90Vac~264Vac ,5.1 ,700mA ,5060 , ,WALL 3P ,USB , | | |
| 3 | | ADAPTOR,AC-DC | SSAD0034003 | 100-240V ,5060 Hz,5.1 V,0.7 A,CE ,AC-DC ADAPTOR ,; ,90Vac~264Vac ,5.1 ,700mA ,5060 , ,WALL 3P ,USB , | | |